Y4.EC7:SO8/12/981/pt.7

ALLOCATION OF RESOURCES IN THE SOVIET UNION AND CHINA—1981

COMPLETED ORIGINAL

HEARINGS

BEFORE THE

SUBCOMMITTEE ON INTERNATIONAL TRADE, FINANCE, AND SECURITY ECONOMICS

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

NINETY-SEVENTH CONGRESS

FIRST SESSION

PART 7

EXECUTIVE SESSIONS

JULY 8 AND OCTOBER 15, 1981

Printed for the use of the Joint Economic Committee

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ALLOCATION OF RESOURCES IN THE SOVIET UNION AND CHINA—1981

WEDNESDAY, JULY 8, 1981

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON INTERNATIONAL TRADE, FINANCE,
AND SECURITY ECONOMICS OF THE
JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee met, pursuant to notice, in executive session, at 10 a.m., in room 1202, Dirksen Senate Office Building, Hon. William Proxmire (vice chairman of the subcommittee) presiding.

Present: Senators Proxmire, Abdnor, and Mattingly.

Also present: James K. Galbraith, executive director; Richard F. Kaufman, assistant director-general counsel; and Charles H. Bradford, assistant director.

OPENING STATEMENT OF SENATOR PROXMIRE, VICE CHAIRMAN

Senator PROXMIRE. The subcommittee will come to order.

This is the eighth year in our annual series of hearings on the allocation of resources in the Soviet Union and China. We're very proud of the record of information and analysis that has been established through this yearly experience. Indeed, the Joint Economic Committee has assessed the economies of the major Communist countries on a regular basis almost since the inception of the committee.

This year is an especially important one to examine these two largest Communist countries. It is the first year of the Soviet Union's new 5-year plan, which makes it an excellent occasion to review their performance during the past 5 years and examine the prospects for the 1980's. China is going through a period of economic turbulence, which could influence trade relations with the West as well as its own political stability, and a review of that country's economy could not be more timely.

Let me say that the joint prepared statement of Maj. Gen. Richard Larkin, Deputy Director, and Edward Collins, Vice Director for Foreign Intelligence, of the Defense Intelligence Agency, is I think the most comprehensive intelligence presentation that I've seen—certainly that we've had in these 8 years. It combines evaluation of the allocation of resources for both military and civilian purposes in the Soviet Union and China. Also, I think it's remarkable for the scholarship as well as the intelligence that went into it. I mean that, gentlemen.

I've had an opportunity to review this remarkable statement, and I think it's a great contribution. And I'm going to do my best to see that other members of the committee are familiar with it. The high quality of this statement makes it all the more important to be able to release it to the public, and I plan to do it shortly after this hearing when, of course, we have it sanitized.

I'm very pleased to welcome you before the subcommittee. I suggest that you summarize your prepared statement by giving us the highlights, and then we'll have a number of questions.

STATEMENT OF MAJ. GEN. RICHARD X. LARKIN, U.S. ARMY, DEPUTY DIRECTOR, DEFENSE INTELLIGENCE AGENCY, AND EDWARD M. COLLINS, VICE DIRECTOR FOR FOREIGN INTELLIGENCE, ACCOMPANIED BY FRANK E. DOE, JR., ECONOMIST, SOVIET MILITARY AFFAIRS; LLOYD N. CORNING, CHIEF, ENERGY BRANCH; JOHN B. MALLON, ECONOMIST, CHINESE MILITARY AFFAIRS; CHARLES F. LEOBOLD, CHIEF, MILITARY MATERIEL PRODUCTION BRANCH; AND NORBERT D. MICHAUD, CHIEF, STRATEGIC DEFENSE ECONOMICS BRANCH

General Larkin. Thank you, Senator Proxmire.

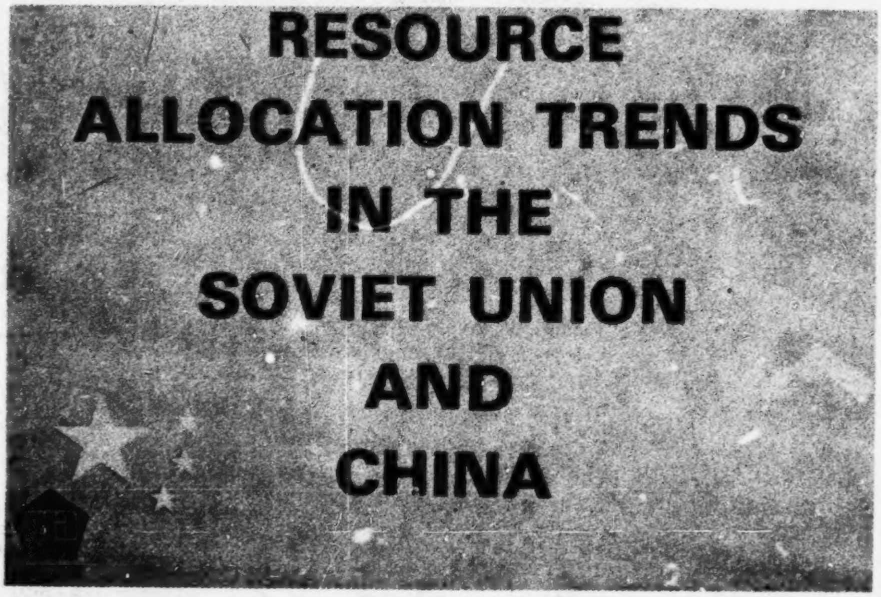
In trying to be helpful, we have a prepared statement at the secret level, and we'll emphasize the information which we believe would be most useful to you on the allocation of resources in the Soviet Union and China. You've already met the other individuals with me.

With your permission, Senator, Mr. Collins, who is our Vice Director for Foreign Intelligence, will present our testimony.

Mr. Collins. Senator, gentlemen, as the subcommittee requested, my testimony today will cover the major Soviet and Chinese military and economic resource trends.

[Slide 1 follows:]

SLIDE 1



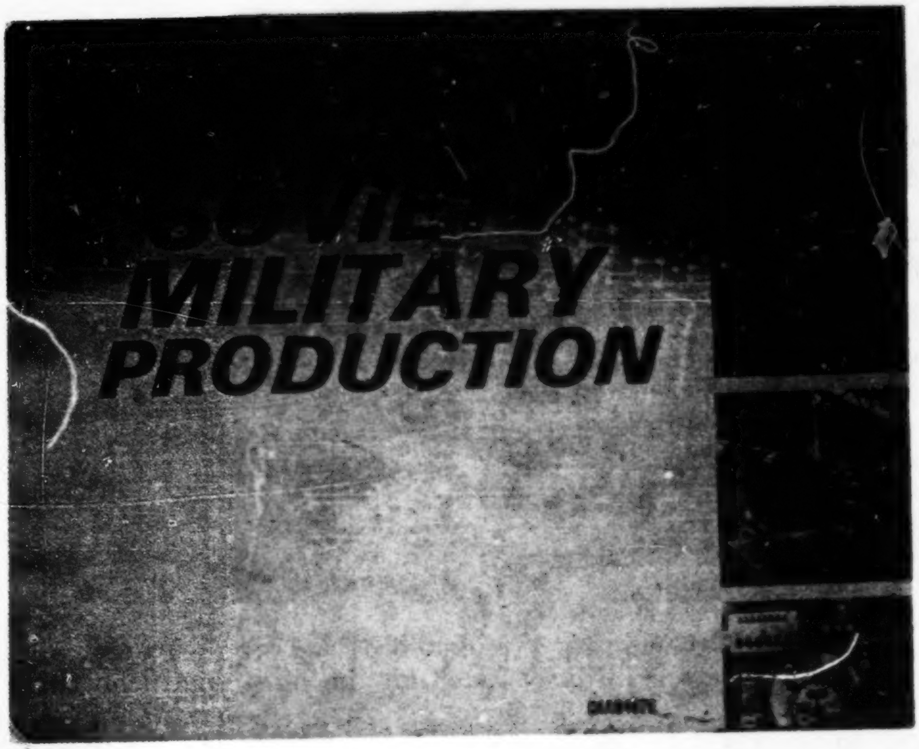
RESOURCE
ALLOCATION TRENDS
IN THE
SOVIET UNION
AND
CHINA

The extensive background paper provided you covered these areas in some detail. I'll only touch on the most significant highlights here.

While the leaders of the Soviet Union and China recognize the intimate relationship between the military and the economy, the courses of action we have observed recently are strikingly different. I will first examine Soviet resource allocation trends.

[Slide 2 follows:]

SLIDE 2



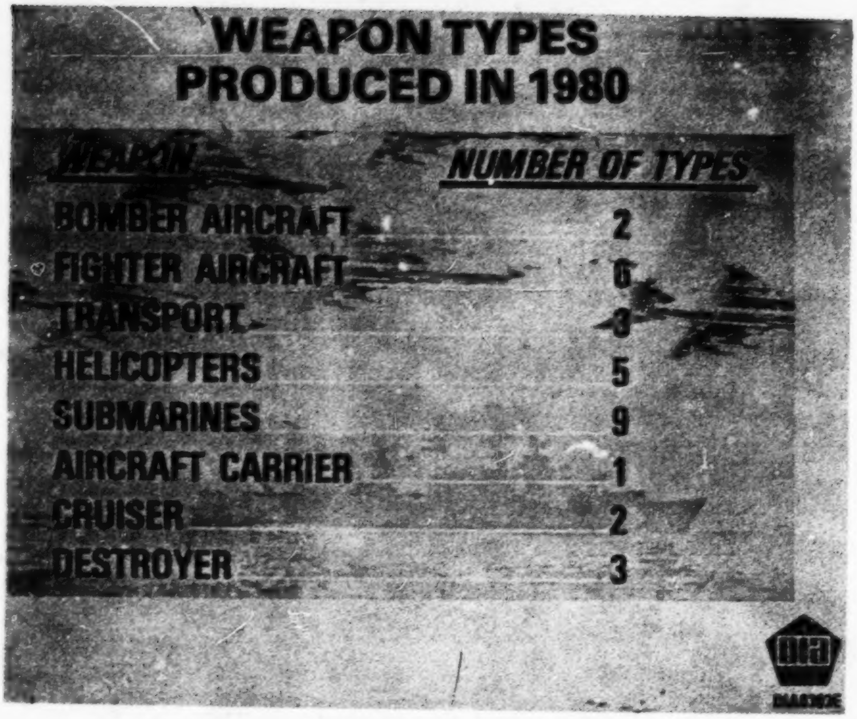
SOVIET
MILITARY
PRODUCTION

The Soviet Union is continuing to increase its military capability by producing large quantities of sophisticated hardware. I focus on production here because it is a good indicator of domestic resources available to the military in a crisis, and reflects the allocation of resources to the military sector.

In 1980, the Soviets were producing 112 military systems, ranging from hand-held weapons to intercontinental ballistic missiles.

[Slides 3, 4, and 5 follow:]

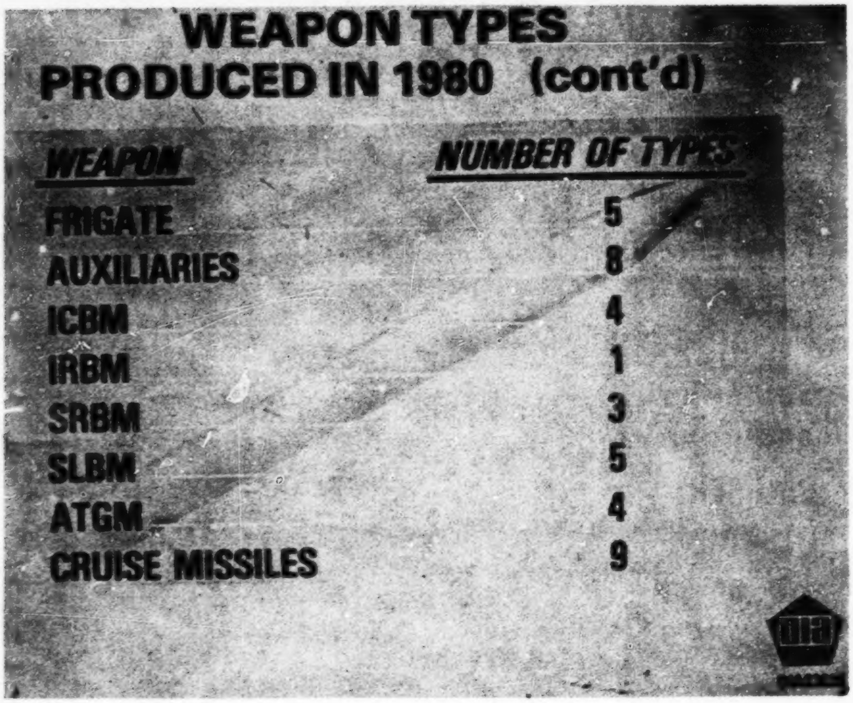
SLIDE 3



WEAPON TYPES PRODUCED IN 1980

WEAPON	NUMBER OF TYPES
BOMBER AIRCRAFT	2
FIGHTER AIRCRAFT	6
TRANSPORT	3
HELICOPTERS	5
SUBMARINES	9
AIRCRAFT CARRIER	1
CRUISER	2
DESTROYER	3

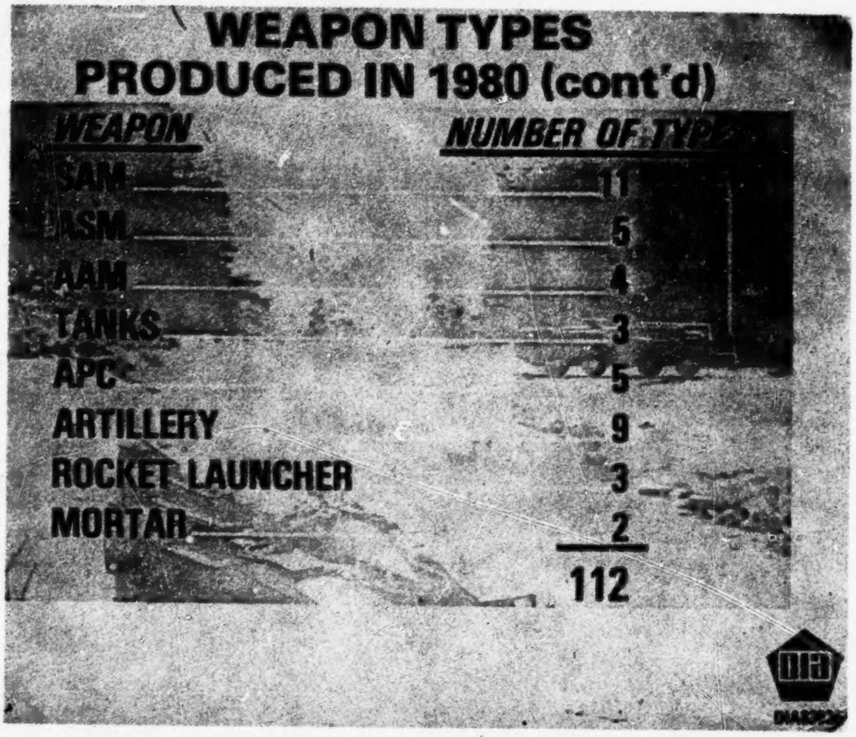
SLIDE 4



WEAPON TYPES PRODUCED IN 1980 (cont'd)

WEAPON	NUMBER OF TYPES
FRIGATE	5
AUXILIARIES	8
ICBM	4
IRBM	1
SRBM	3
SLBM	5
ATGM	4
CRUISE MISSILES	9

SLIDE 5

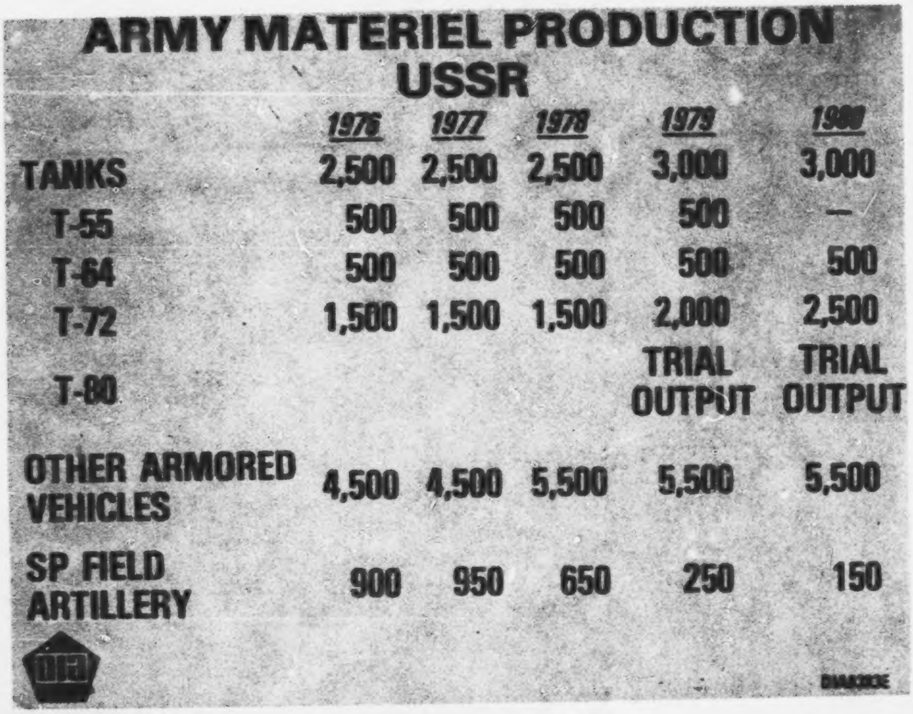


WEAPON TYPES PRODUCED IN 1980 (cont'd)

WEAPON	NUMBER OF TYP
SAM	11
ASM	5
AAM	4
TANKS	3
APC	5
ARTILLERY	9
ROCKET LAUNCHER	3
MORTAR	2
	112

These three slides show some of these weapon types.
[Slide 6 follows:]

SLIDE 6



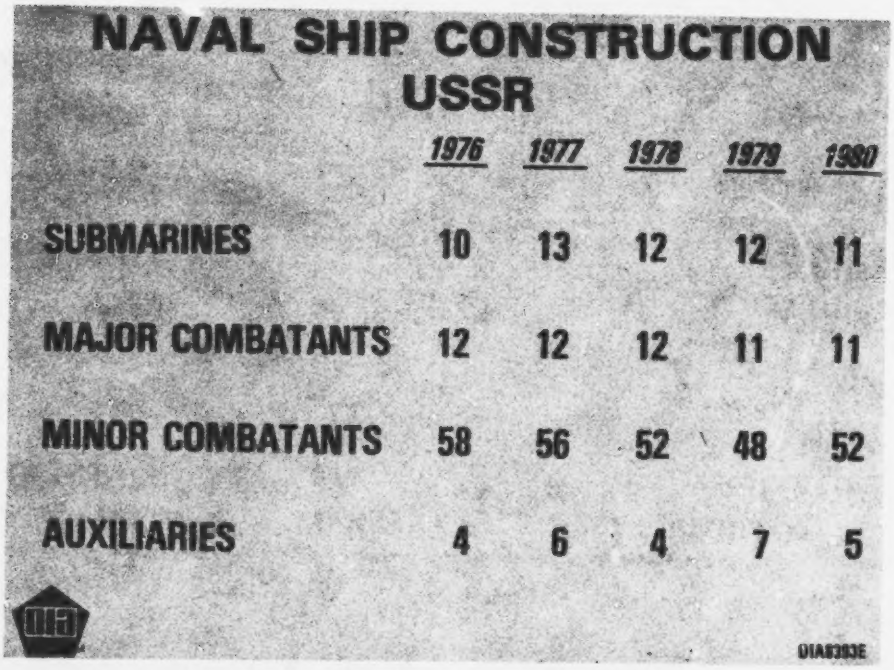
ARMY MATERIEL PRODUCTION
USSR

	1976	1977	1978	1979	1980
TANKS	2,500	2,500	2,500	3,000	3,000
T-55	500	500	500	500	—
T-64	500	500	500	500	500
T-72	1,500	1,500	1,500	2,000	2,500
T-80				TRIAL OUTPUT	TRIAL OUTPUT
OTHER ARMORED VEHICLES	4,500	4,500	5,500	5,500	5,500
SP FIELD ARTILLERY	900	950	650	250	150

Army materiel output generally has maintained a high production level. In contrast, self-propelled artillery showed a decline. This, however, merely represents an old weapon phasing out, and a new one that is more capable, complex and costly starting its production run. This type of transition is common in the Soviet military production system.

[Slide 7 follows:]

SLIDE 7



NAVAL SHIP CONSTRUCTION USSR

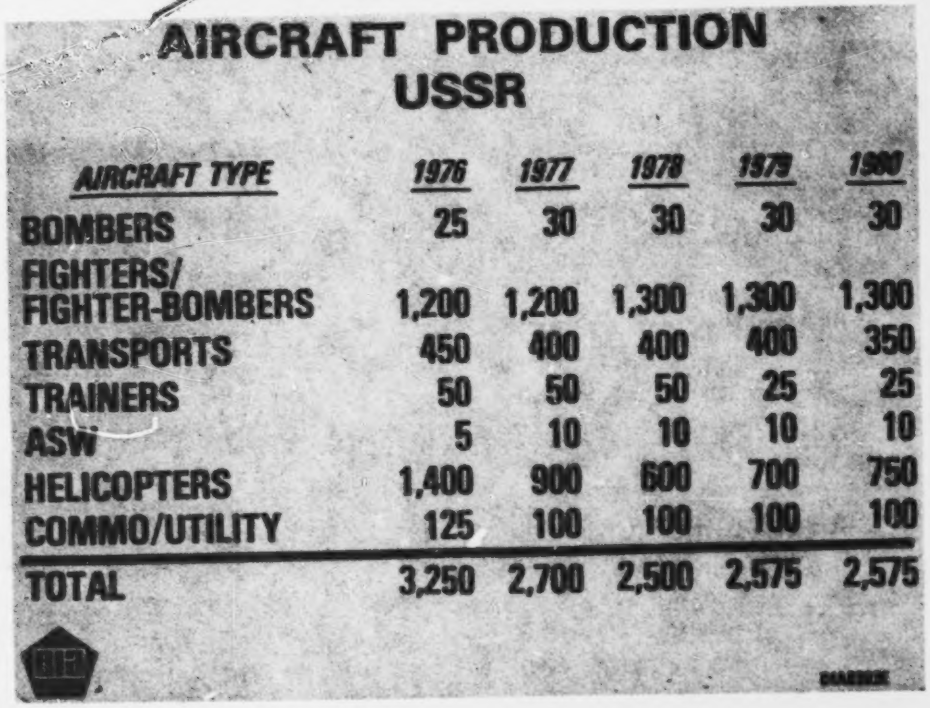
	1976	1977	1978	1979	1980
SUBMARINES	10	13	12	12	11
MAJOR COMBATANTS	12	12	12	11	11
MINOR COMBATANTS	58	56	52	48	52
AUXILIARIES	4	6	4	7	5

DIA8393E

Naval ship production demonstrates the capability to sustain high output rates throughout the period shown, with more recent ships being larger and more capable than their predecessors.

[Slide 8 follows:]

SLIDE 8



AIRCRAFT PRODUCTION
USSR

AIRCRAFT TYPE	1976	1977	1978	1979	1980
BOMBERS	25	30	30	30	30
FIGHTERS/ FIGHTER-BOMBERS	1,200	1,200	1,300	1,300	1,300
TRANSPORTS	450	400	400	400	350
TRAINERS	50	50	50	25	25
ASW	5	10	10	10	10
HELICOPTERS	1,400	900	600	700	750
COMMO/UTILITY	125	100	100	100	100
TOTAL	3,250	2,700	2,500	2,575	2,575

Among aircraft, the most significant aspect is the sustained high rate of fighter production.

Senator PROXMIRE. For the record—I realize that you couldn't do it comprehensively. But in these tables, it's hard to put into perspective the significance of this production level. As you say, it's a steady level, by and large. But if we could have some where you could do it—if we could have some spot comparisons with our own production, it would put that into a perspective of what we're doing compared with what they're doing.

Mr. COLLINS. Yes, sir.

We have an abbreviated comparison for 1979 on the next slide, which we will show you after the missile slide.

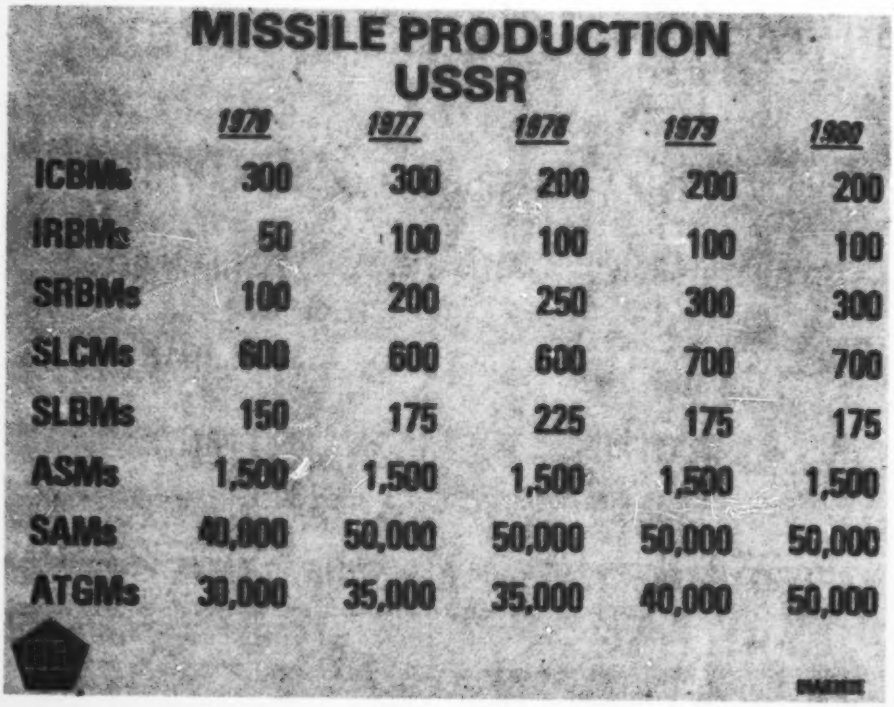
[The slide presented at this point is a security deletion.]

Senator PROXMIRE. There it is.

Mr. COLLINS. I'm not sure you had an opportunity to look at the missile slide. We'll back up one, if you like.

[Slide 9 follows:]

SLIDE 9



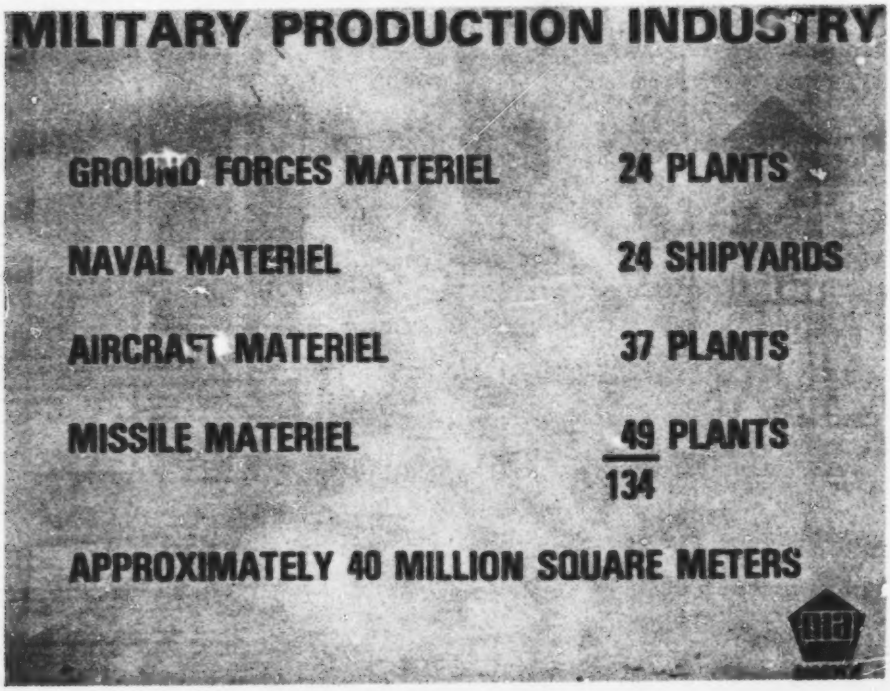
MISSILE PRODUCTION
USSR

	1976	1977	1978	1979	1980
ICBMs	300	300	200	200	200
IRBMs	50	100	100	100	100
SRBMs	100	200	250	300	300
SLCMs	600	600	600	700	700
SLBMs	150	175	225	175	175
ASMs	1,500	1,500	1,500	1,500	1,500
SAMs	40,000	50,000	50,000	50,000	50,000
ATGMs	30,000	35,000	35,000	40,000	50,000

Soviet missile production consists of high rates of output for systems ranging from antitank weapons to MIRV'ed ICBM's. Only the United States produces as varied a group of weapons as the Soviets. However, the United States has signficantly lower output rates.

[Slide 10 follows:]

Slide 10



MILITARY PRODUCTION INDUSTRY

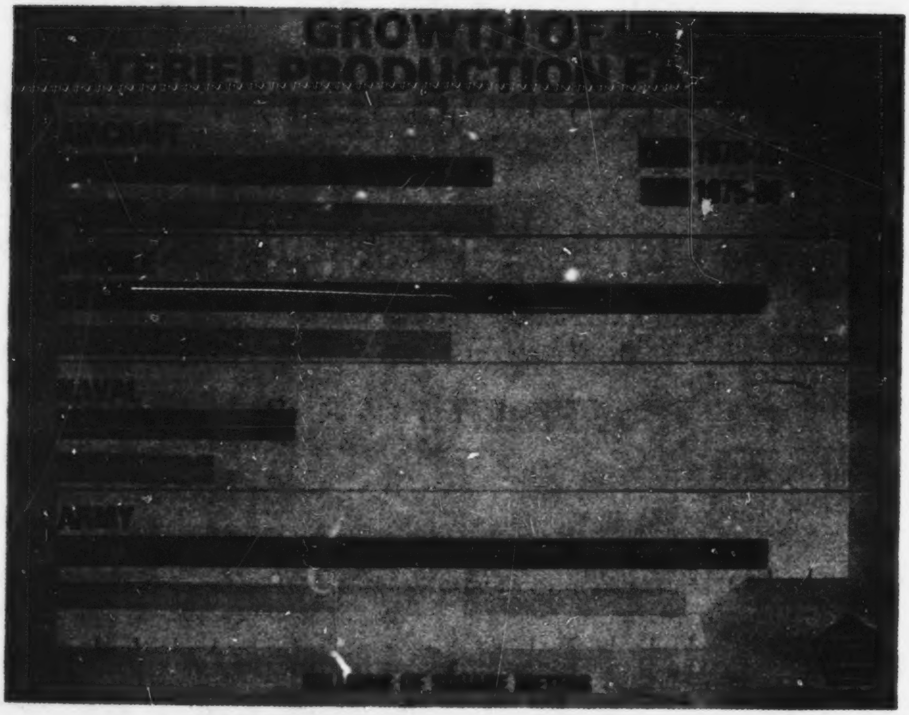
GROUND FORCES MATERIEL	24 PLANTS
NAVAL MATERIEL	24 SHIPYARDS
AIRCRAFT MATERIEL	37 PLANTS
MISSILE MATERIEL	49 PLANTS
	134

APPROXIMATELY 40 MILLION SQUARE METERS

The Soviet military production figures are most informative when placed next to data on U.S. production for 1979, the latest year for which comparable figures are available.

[Slide 11 follows:]

SLIDE 11

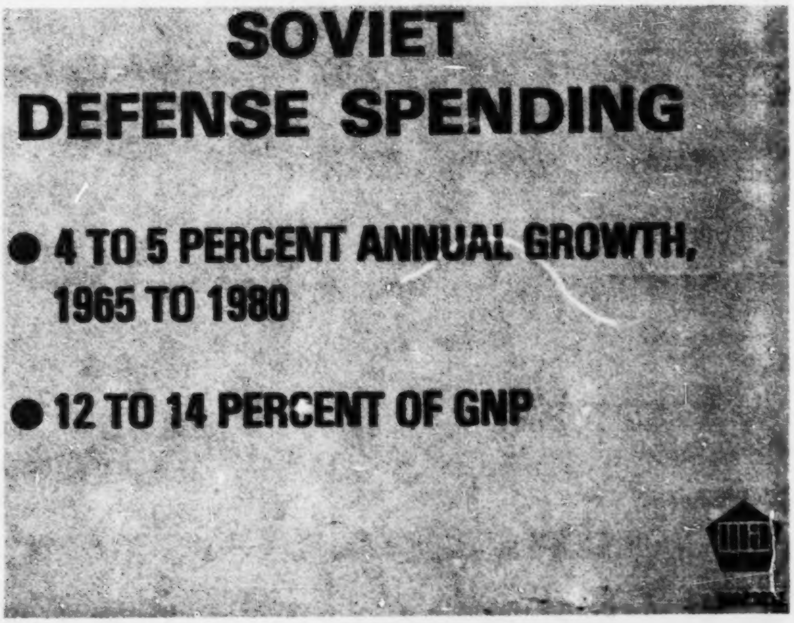


The Soviet materiel production effort is supported by a large defense industry. Defense industry plants currently produce over 60 percent of the output of the machinery sector. The machinery industry is of key importance for investment and consumer durables. Military output in most of these defense plants is a direct competitor for resources with civilian goods.

The data we had hoped to provide you on the defense industry in 1981 has, unfortunately, not yet become available.

[Slide 12 follows:]

SLIDE 12



SOVIET
DEFENSE SPENDING

- 4 TO 5 PERCENT ANNUAL GROWTH, 1965 TO 1980
- 12 TO 14 PERCENT OF GNP

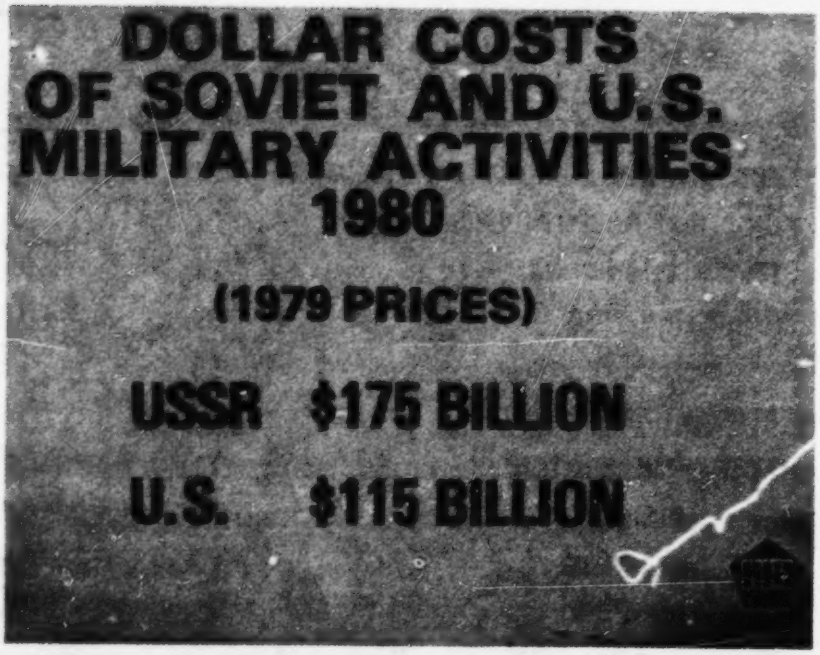
Defense industry floor space has steadily increased in the past 10 years. The absolute amount of expansion shown here represents growth of between 2 and 3 percent annually.

Military production activities are reflected by trends in military spending. The ruble value of Soviet military activities rose at an average rate of 4 to 5 percent during the past decade and a half, as calculated in constant prices. The economic impact of these outlays has increased in the past 2 years.

Military activities now absorb some 14 percent of Soviet gross national product, compared to less than 6 percent in the United States.

[Slide 13 follows:]

SLIDE 13



DOLLAR COSTS
OF SOVIET AND U.S.
MILITARY ACTIVITIES
1980

(1979 PRICES)

USSR $175 BILLION

U.S. $115 BILLION

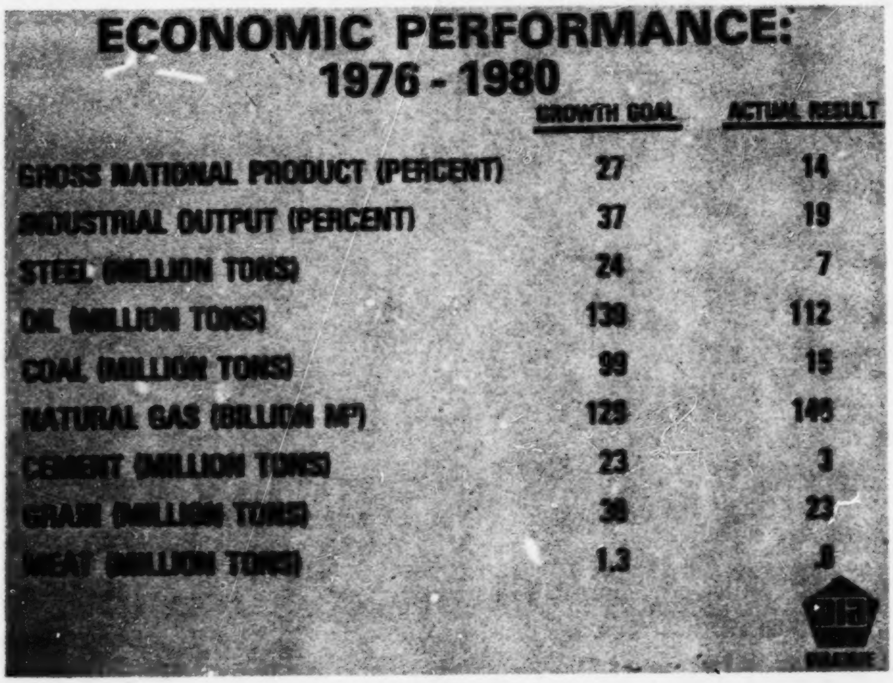
To gage the size of the Soviet military effort, we can compare the dollar cost of Soviet military activities to U.S. defense spending. The dollar cost of Soviet military activities was 52 percent greater than that of the United States in 1980. Note that removal of the index number bias involved in dollar cost comparisons may reduce the Soviet margin to as little as one-third greater.

[The slide presented at this point is a security deletion.]

The military resource trends I have just covered are the result of conscious policy decisions by the Soviet leadership. Soviet military officers and political leaders alike are well aware of the relationship between the military and the economy, but have chosen to give the military priority at the expense of economic growth. This has been particularly noticeable in the past 2 years, as the military effort continued to grow, while economic growth slumped.

[Slide 14 follows:]

SLIDE 14



ECONOMIC PERFORMANCE: 1976 - 1980

	GROWTH GOAL	ACTUAL RESULT
GROSS NATIONAL PRODUCT (PERCENT)	27	14
INDUSTRIAL OUTPUT (PERCENT)	37	19
STEEL (MILLION TONS)	24	7
OIL (MILLION TONS)	139	112
COAL (MILLION TONS)	99	15
NATURAL GAS (BILLION M^3)	129	146
CEMENT (MILLION TONS)	23	3
GRAIN (MILLION TONS)	38	23
MEAT (MILLION TONS)	1.3	.8

I would like to turn to Soviet economic performance briefly to provide the context for the ongoing rise in the Soviet military effort.

The Soviets finished their 10th 5-year plan in 1980 with significant shortfalls in most sectors.

Senator PROXMIRE. They seem to have had a larger growth in natural gas than they anticipated.

Mr. COLLINS. Yes, sir. Natural gas it the one bright spot.

Senator PROXMIRE. They exceeded their goal.

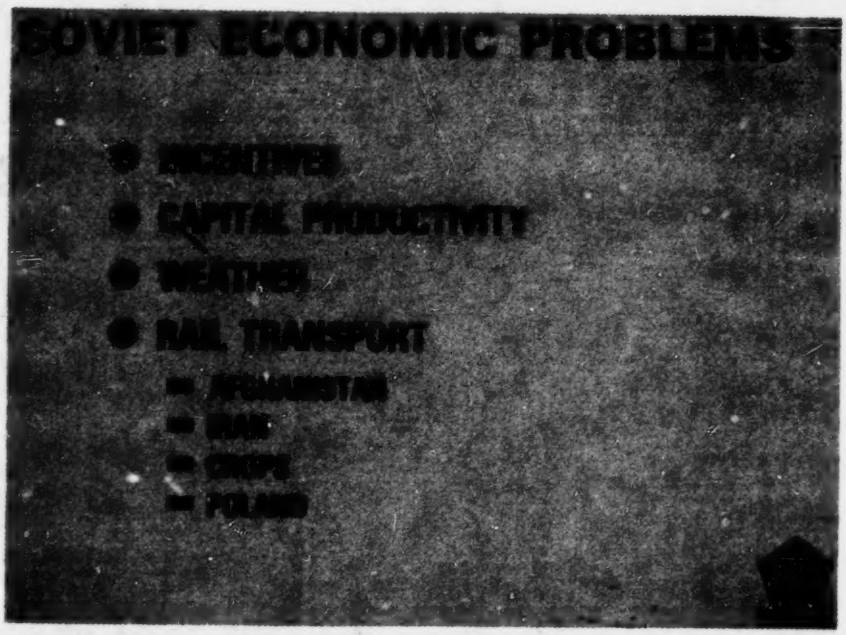
Mr. COLLINS. They exceeded the lower end of their planned range of output substantially. That's the one bright spot in their economic performance.

Gross national product increased by roughly half the desired amounts during the past 5 years, and growth was only about 1 percent during each of the past 2 years. This is far below the 5 percent growth of a decade ago.

Food has been a major problem in the past year and a half, as noted in our prepared statement.

[Slide 15 follows:]

SLIDE 15



SOVIET ECONOMIC PROBLEMS

- INCENTIVES
- CAPITAL PRODUCTIVITY
- WEATHER
- RAIL TRANSPORT
  - AFGHANISTAN
  - IRAN
  - CROPS
  - POLAND

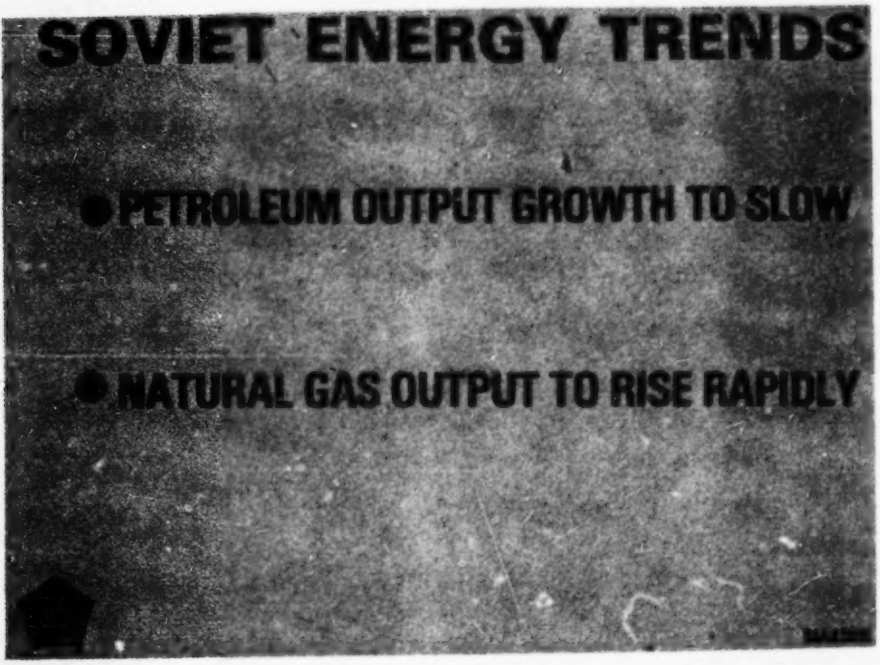
Poor Soviet economic performance is the result of a number of factors, including longstanding problems with worker incentives, declining capital productivity, and the weather. Some of the more recent difficulties stem from the rail system being overloaded. The needs of Afghanistan and transshipment of European goods to Iran began to clog the transport system in 1979. The particularly small crops in 1979 and 1980 exacerbated the rail problem, because [security deletion]. Rail problems have contributed to major shortfalls in the delivery of materials to all parts of industry, including the defense sector.

[The slide presented to at this point is a security deletion.]

Perhaps the most important indicator of the economic problems, particularly related to food shortages, has been the increase in reported incidences of domestic unrest, including work stoppages and riots. [Security deletion.] The seriousness with which they are viewed by the leadership is indicated by increased official attention to motivating the police and the tightly controlled labor unions, more strict enforcement including capital punishment for violations of laws on economic matters, and the institution of [security deletion].

[Slide 16 follows:]

SLIDE 16



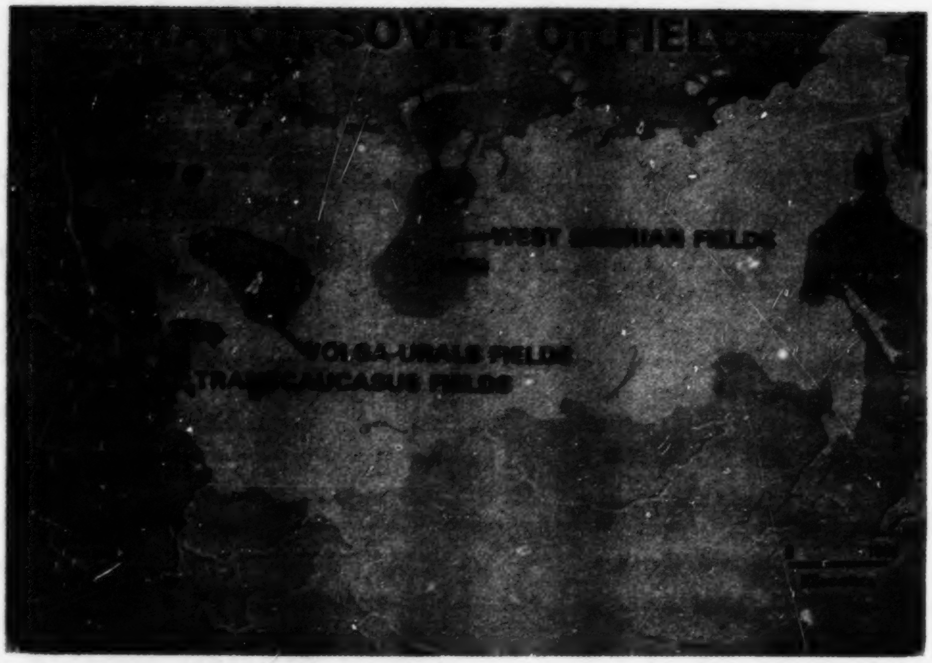
SOVIET ENERGY TRENDS

- PETROLEUM OUTPUT GROWTH TO SLOW
- NATURAL GAS OUTPUT TO RISE RAPIDLY

There is one fairly bright spot in the Soviet economic situation—energy. Soviet oil production has continued to expand, though at declining rates, and prospects are for slow growth through 1985. Output of natural gas, the other major source of Soviet energy growth, is expected to rise at a rate of roughly 7 percent during the 1980's.

[Slide 17 follows:]

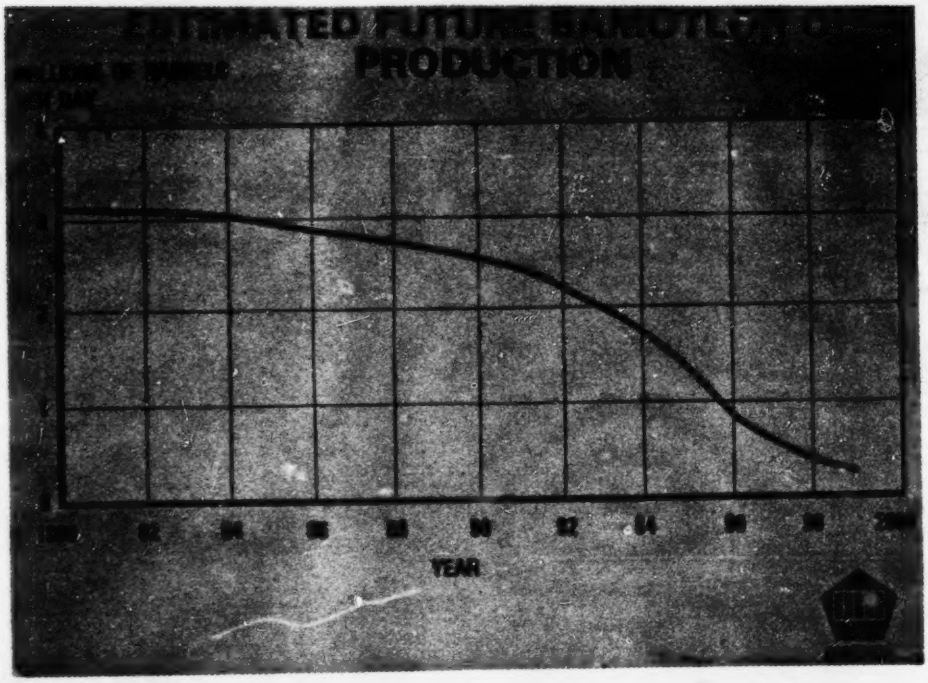
SLIDE 17


SOVIET OIL FIEL
WEST SIBERIAN FIELDS
VOLGA-URALS FIELDS
TRANSCAUCASUS FIELDS

Our oil projection is based on a number of factors, the details of which are in the prepared statement. First, the existence of major oil fields whose proven recoverable reserves amount to between 79 and 85 billion barrels. The older fields in Baku and the Volga Basin are in a slow decline, but the West Siberian area has not even been fully explored, and already accounts for over half of Soviet oil production.

[Slide 18 follows:]

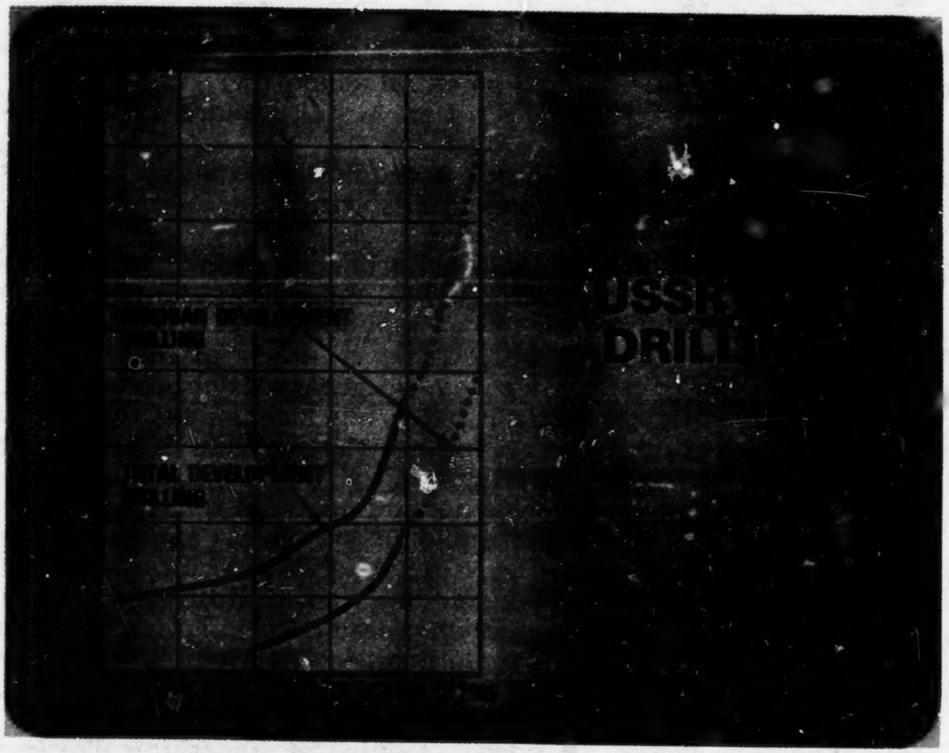
SLIDE 18



The largest single West Siberian field, Samotlor, which accounts for a quarter of Soviet oil, is not expected to decline significantly until after 1990, even though it is at its peak output. This leaves time to develop and put into full production additional fields to counterbalance the older fields' declines.

[Slide 19 follows:]

Slide 19



The sharp upward trend in Soviet drilling activity also makes future growth appear likely.

ENERGY AND ECONOMIC GROWTH

Senator **Proxmire**. Let me interrupt to ask a question here on the growth in energy production. You say that's one of the few bright spots in their economic future.

Mr. **Collins**. Yes, sir.

Senator **Proxmire**. Is it possible, because of the importance of energy, that their success here can help them achieve the goals of their new Five-Year Plan? That is, do the facts debunk the idea, discussed so much in the West, that the Soviet Union faces an economic crisis; may be declining and withering?

Are we making the supreme miscalculation of underestimating the economic strength of our potential adversary?

Mr. **Collins**. Senator, I would like to defer to the expert who has done the work on this, Lloyd Corning, for an answer to that question. I'm not sure you heard it, Lloyd.

Mr. **Corning**. I thought it had more relationship with economics than energy.

Senator **Proxmire**. It relates to both. It relates to the importance of energy, of course, in economic growth and economic progress. We're very conscious of it here. I'm sure it's vital, also, in the Soviet Union.

My question is, Is their remarkable performance in natural gas and oil production—is that likely to overcome their other weaknesses sufficiently so the notion that they may be declining, or losing ground economically, may be a mistaken estimate on our part, and may put us in the position of underestimating the economic strength of our principal potential adversary?

Mr. **Collins**. May I suggest, sir, that Mr. Doe address that question.

Mr. **Doe**. Sir, we have taken into account Soviet energy prospects when we look at their likely economic growth.

Senator **Proxmire**. When?

Mr. **Doe**. We looked at their likely economic growth in this upcoming 1981 to 1985 time period. The total energy supply in the Soviet Union is likely to grow at between 2 and 3 percent per year. Natural gas looks good. Oil will grow very slowly, perhaps only 1 percent. Coal is not likely to grow very quickly. Hydroelectric and nuclear power will grow fairly rapidly, but that makes up a very small proportion of total energy. In toto we're looking at something like 2 to 3 percent net energy growth.

This upward trend, however, is not so important relative to what else is happening in the Soviet economic system. Their labor force growth is going down toward zero. Their ability to increase labor productivity, which is so dependent on their fulfillment of their plans for consumer goods production, doesn't look like it's going to work out very well. There is little prospect for them to radically increase the output per worker.

They're continuing to have problems with their capital investments. The net result is that we're looking at something like less than 2 percent GNP growth, on the average, between now and 1985. The Eleventh Five-Year Plan, as announced, is internally inconsistent, and it's highly unlikely that they can successfully complete that plan.

Senator **Proxmire**. May I ask General Larkin to comment?

General **Larkin**. Yes, sir.

I'd say their most immediate return from energy is the hard currency return of about $22 billion, maybe $11 billion from oil and $11 billion from natural gas. This will permit them to buy——

Senator **Proxmire**. Will you repeat that? I think I missed that.

General **Larkin**. The most immediate return of their energy surplus would be the hard currency return to the Soviet Union—around $22 billion, I believe, is the forecast. This would permit them to buy technology, but it will not counterbalance those soft spots in the economy that Mr. Doe just explained: the labor market, for one; their lack of consumer expansion; and frankly, their dedication to the defense industry, which is not good for the economic growth of the country as a whole.

The energy figures have been taken into account in the overall assessment of economic growth forecast, and they have been overbalanced by the other factors.

MANPOWER

Senator **Proxmire**. That's reassuring, General. But we've very conscious of the proposals in this country to keep our workers at work longer than 62 and 65 and so forth. In the Soviet Union, don't you have a situation where workers retire even younger, and where therefore they have flexibility too? And because of their greater discipline over their people, isn't it possible that they would be able to bring their people who might be expected to retire into production situations more than they have in the past, and keep them there?

Don't they have a degree of ability to increase their manpower that way?

General LARKIN. As you well know, they have strict control over their people. They can increase their manpower somewhat by keeping people on the job, but they are not in the same position as the Western countries are, where in addition to natural increases people are entering the country all the time, adding to the manpower force.

The Soviets have a very sterile situation in that respect. They have closed borders.

Senator PROXMIRE. What's the retirement age for men and women in the Soviet Union?

Mr. COLLINS. Mr. Doe.

Mr. DOE. The age is 55 years for women.

Senator PROXMIRE. Fifty-five for women.

Mr. DOE. And 60 years for men.

Senator PROXMIRE. Sixty for men.

Well, that seems to me, in view of the fact that they're getting greater longevity too, that they have a degree of flexibility here we may be overlooking.

Mr. DOE. Sir, we've examined their capability to get effective work out of people in that age group. They have made a large number of changes in the incentive system and their pension payout system to encourage those people to return to the job market. It turns out, when you examine the size of the over-55 cohort, you discover that those are the people who were most directly affected by the losses during World War II, by the purges just prior to the war, and by the collectivization effort by Stalin around 1930. There's a very small number of people in that cohort relative to the total Soviet labor force.

Many of these people are not in good health, and so far, their ability to attract pensioners to the labor force has not been very successful. We see no prospect for that to become very successful.

Senator PROXMIRE. Thank you. Go ahead, Senator Abdnor.

Senator ABDNOR. Thank you, Senator.

I came in here rather late. It wouldn't be fair for me to try to ask——

Senator PROXMIRE. We're proceeding, I believe. Is that right?

Mr. COLLINS. Yes, sir.

Senator PROXMIRE. They are reading through their abbreviated statement, and we may interrupt for a question or two, so feel free to ask now if you want to do so, Senator. We haven't come to the question period yet.

Senator ABDNOR. All right, fine.

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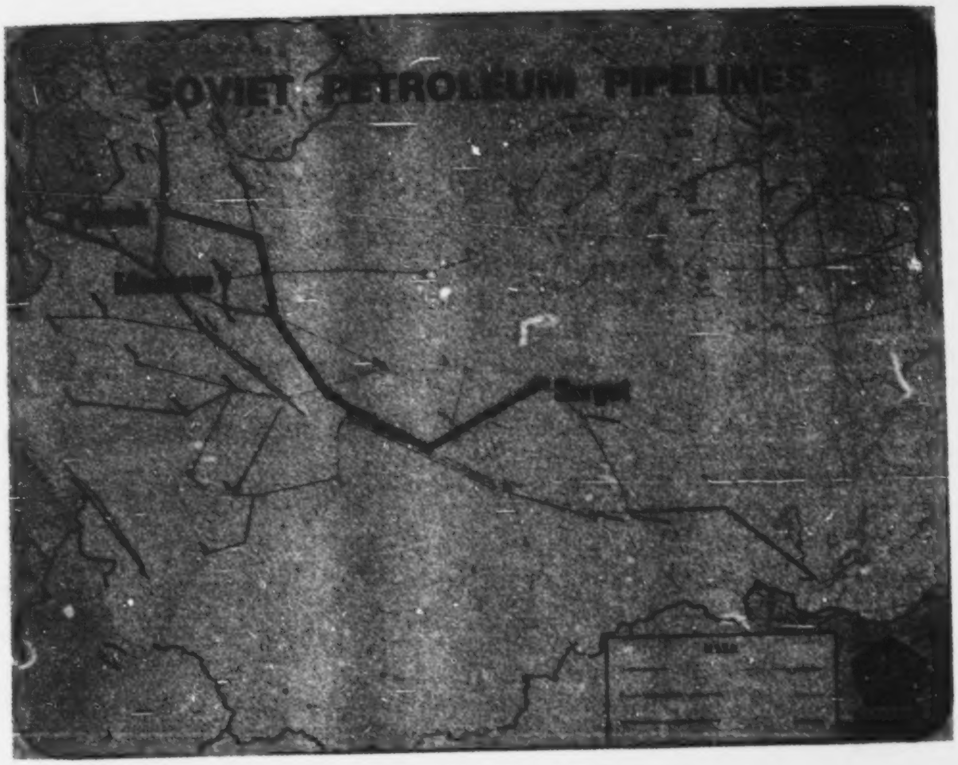

Mr. Collins. A final indication of expected growth is the continued construction of pipeline. The major Surgut-Polotsk line, just completed, is highlighted here, Soviet plans for pipeline construction in the next 5 years call for a tripling of effort over the past 5 years.

This is significant, because an independent review panel in the Soviet energy bureaucracy must be fully convinced that reserves exist, and are economically obtainable, before any pipe can be laid. The plans for new lines indicate that substantial flows from new deposits are expected by Soviet experts.

These flows will allow Soviet oil exports to continue, even if at reduced volumes with the result that hard currency earnings from oil alone in 1985 should approximate $11 billion.

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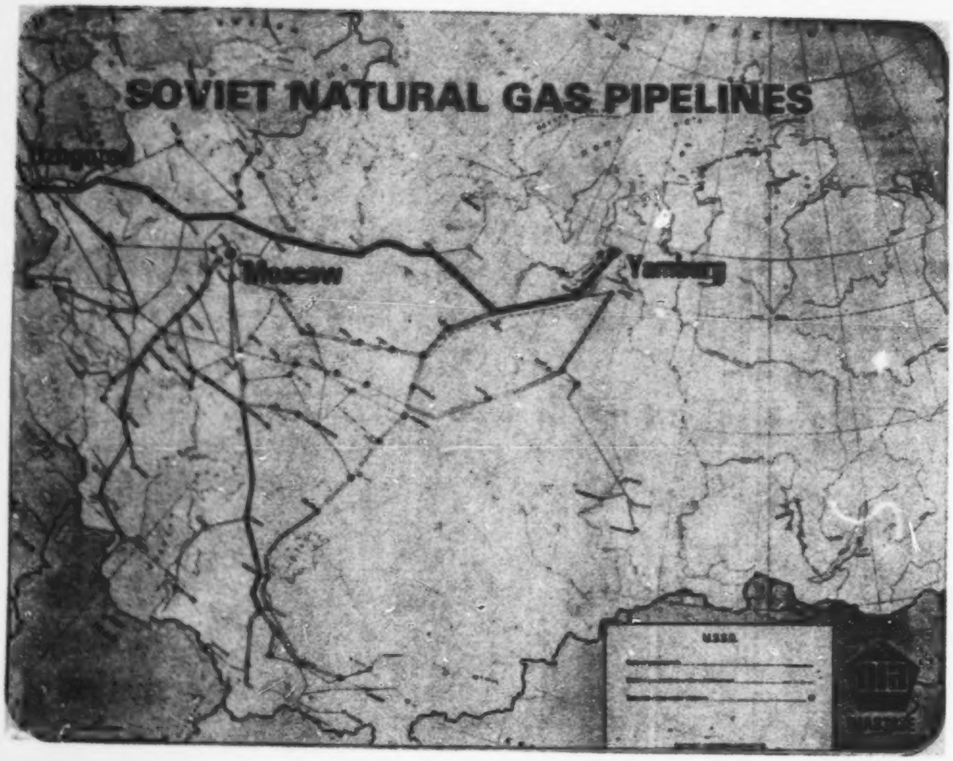
SOVIET NATURAL GAS PIPELINES

Natural gas is the Soviets' energy ace in the hole.

Proven Soviet gas reserves are staggering in size—some 30 trillion cubic meters, or six times the U.S. total. These are mostly in the West Siberian area, where the Yamburg line originates. The Yamburg line is likely to follow the highlighted route on its way to supply both Eastern and Western Europe.

The current negotiations over Western financing indicate the Soviets feel confident about their bargining position. If there is no massive deterioration in East-West relations, the Soviet Union could be supplying as much as one-third of some NATO countries' natural gas by 1987. Hard currency revenues from these exports could total $11 billion a year at that time.

The overall Soviet energy production effort is likely to result in larger total output each year through the 1980's and beyond.

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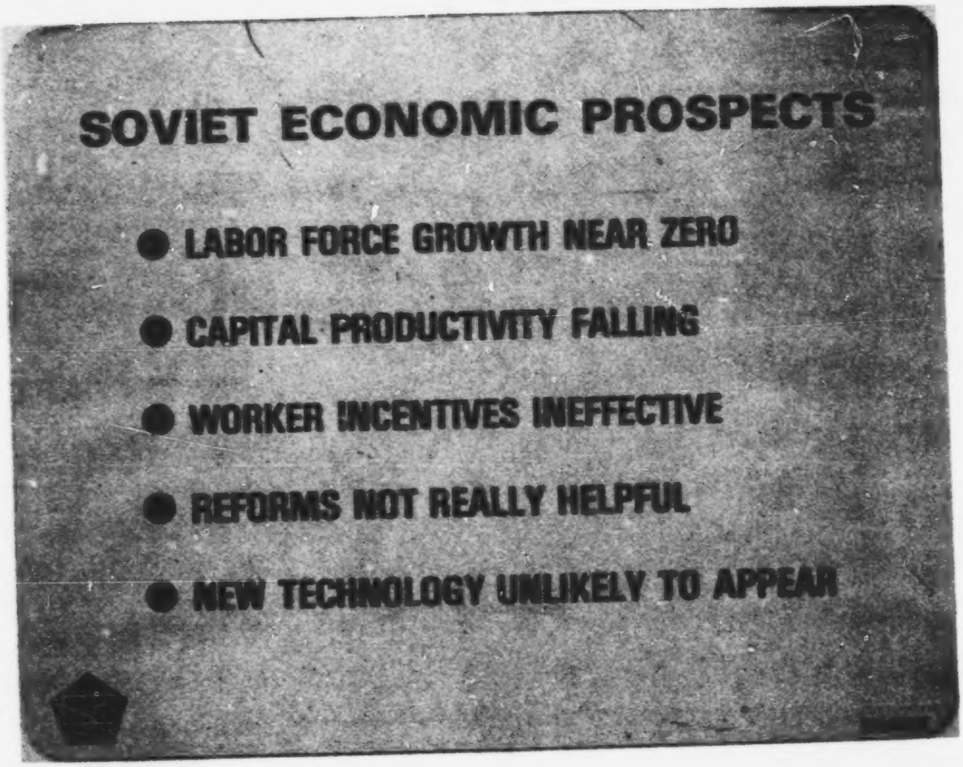

SOVIET ECONOMIC PROSPECTS

- LABOR FORCE GROWTH NEAR ZERO
- CAPITAL PRODUCTIVITY FALLING
- WORKER INCENTIVES INEFFECTIVE
- REFORMS NOT REALLY HELPFUL
- NEW TECHNOLOGY UNLIKELY TO APPEAR

Even this positive energy situation is not likely to result in rapid economic progress for the Soviets.

Labor force growth will drop to nearly zero in the mid-1980's. Capital productivity is a growing problem, and incentives for workers are very ineffective. The Soviets are making some fairly minor reform attempts, but no great progress appears likely.

Even the optimistic Soviet plans for the economy through 1985 are the lowest in history. The stress on increased productivity during 1981 to 1985 depends on successful dissemination of new technology on a scale never approached in a centrally planned economy. When Soviet planned growth is compared to their own projections of U.S. economic growth, it appears that Soviet specialists see little chance of making economic progress relative to the United states, much less "overtaking and surpassing," as was once their goal.

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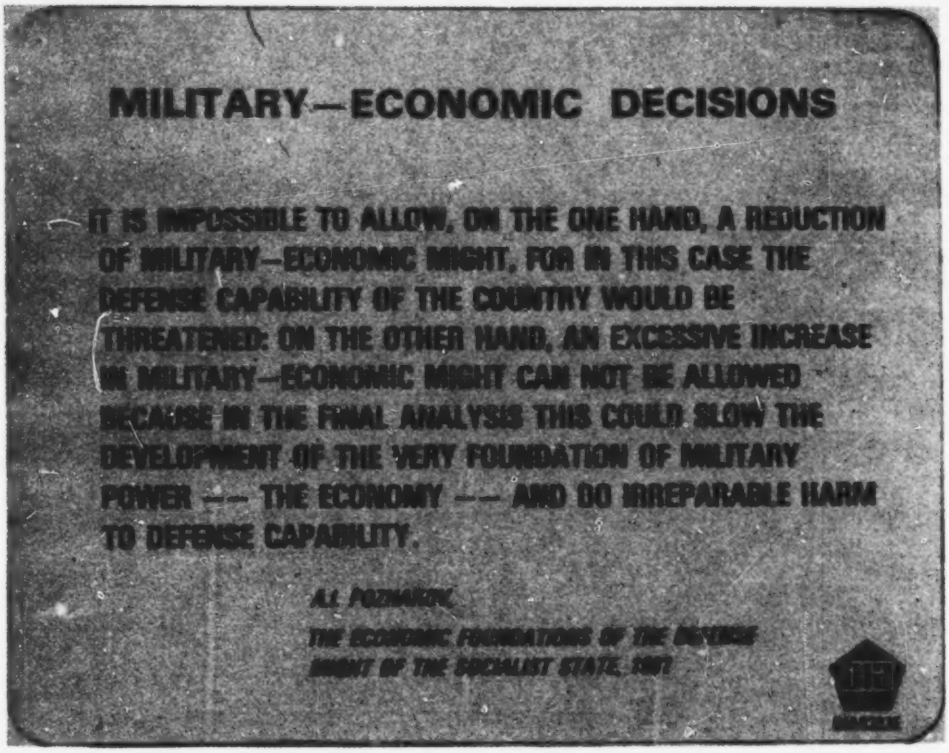

MILITARY—ECONOMIC DECISIONS

IT IS IMPOSSIBLE TO ALLOW, ON THE ONE HAND, A REDUCTION OF MILITARY—ECONOMIC MIGHT, FOR IN THIS CASE THE DEFENSE CAPABILITY OF THE COUNTRY WOULD BE THREATENED: ON THE OTHER HAND, AN EXCESSIVE INCREASE IN MILITARY—ECONOMIC MIGHT CAN NOT BE ALLOWED BECAUSE IN THE FINAL ANALYSIS THIS COULD SLOW THE DEVELOPMENT OF THE VERY FOUNDATION OF MILITARY POWER —— THE ECONOMY —— AND DO IRREPARABLE HARM TO DEFENSE CAPABILITY.

A.I. POZHAROV,

THE ECONOMIC FOUNDATIONS OF THE DEFENSE MIGHT OF THE SOCIALIST STATE, 1981

Given this economic context, and the continued desire for greater military power, the Soviets are facing some very difficult decisions.

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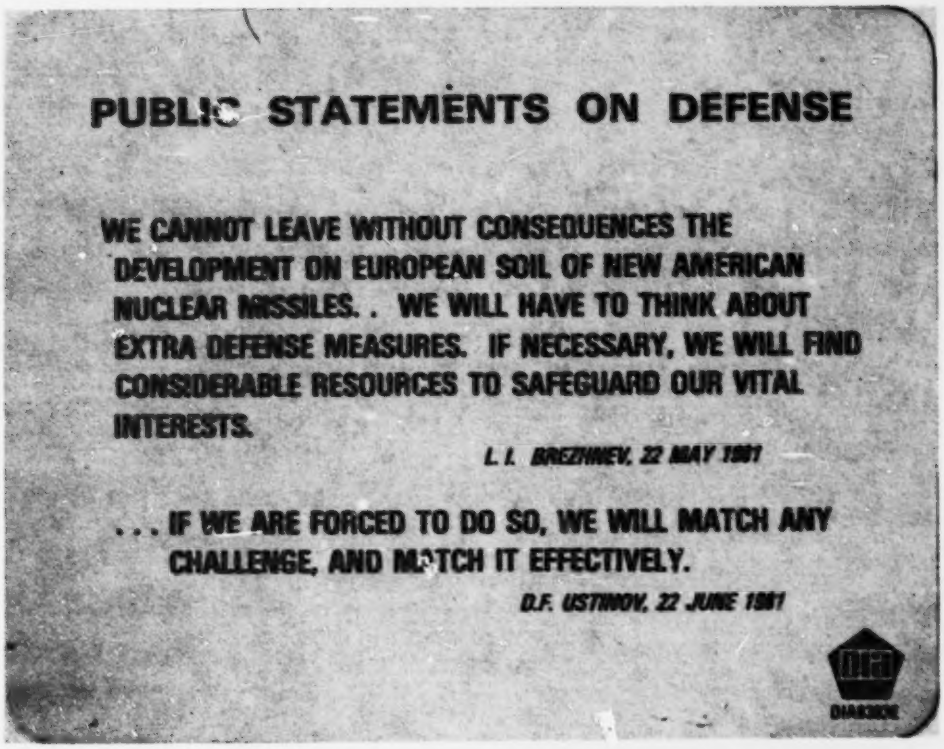

PUBLIC STATEMENTS ON DEFENSE

WE CANNOT LEAVE WITHOUT CONSEQUENCES THE DEVELOPMENT ON EUROPEAN SOIL OF NEW AMERICAN NUCLEAR MISSILES. . WE WILL HAVE TO THINK ABOUT EXTRA DEFENSE MEASURES. IF NECESSARY, WE WILL FIND CONSIDERABLE RESOURCES TO SAFEGUARD OUR VITAL INTERESTS.

L. I. BREZHNEV, 22 MAY 1981

. . . IF WE ARE FORCED TO DO SO, WE WILL MATCH ANY CHALLENGE, AND MATCH IT EFFECTIVELY.

D.F. USTINOV, 22 JUNE 1981

Nonetheless, Soviet officials are sending clear public signals regarding their military effort. [Security deletion.] General Secretary Brezhnev and Defense Minister Ustinov have been unequivocal in this regard.

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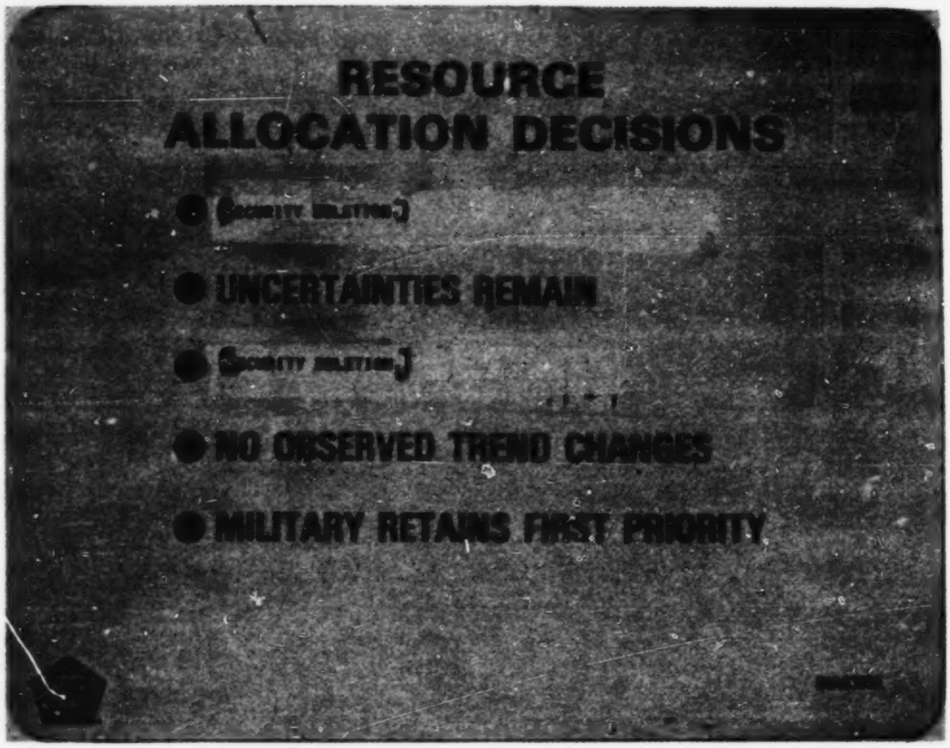

RESOURCE ALLOCATION DECISIONS

- [Security deletion]
- UNCERTAINTIES REMAIN
- [Security deletion]
- NO OBSERVED TREND CHANGES
- MILITARY RETAINS FIRST PRIORITY

Out of the public eye, however, the likely course of the Soviet military effort is not so clear. [Security deletion] even following approval of the 11th 5-year plan. The question being debated is whether [security deletion].

The lack of detail contained in the draft plans approved in February suggests that the question has not been resolved. While those guidelines left room for substantial growth in military spending if the remainder of the plan were fulfilled [security deletion]. Based on actions observed to date, the Soviet military will continue to expand at roughly historical rates. Defense industry continues to grow. New systems in testing remain at earlier levels, and the military research effort has shown no signs of diminishing.

Soviet leaders have apparently opted for further increases in military strength, while allowing economic growth to continue its downward slide.

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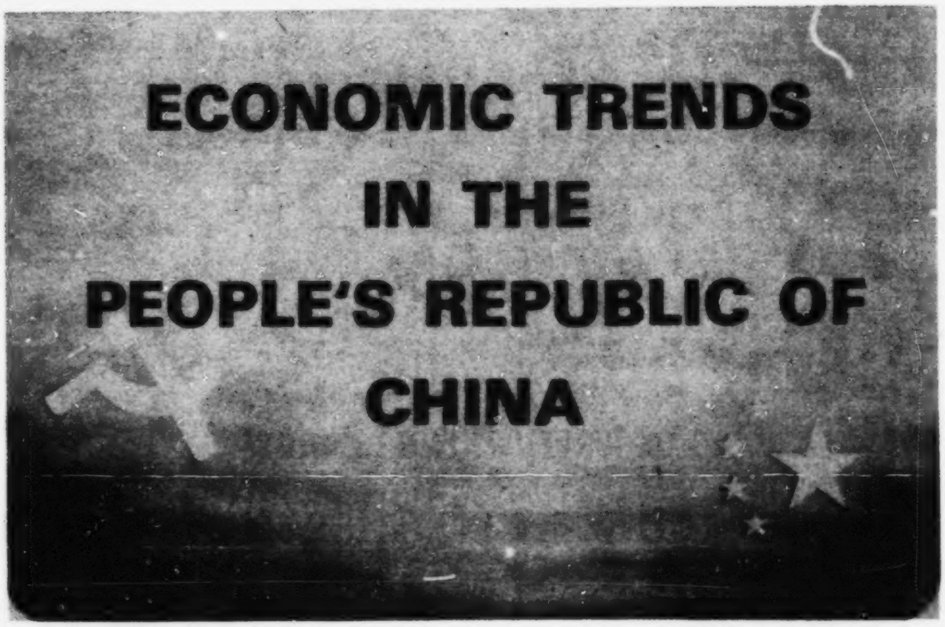

ECONOMIC TRENDS
IN THE
PEOPLE'S REPUBLIC OF
CHINA

I would now like to turn to the very different trends in China. China's domestic and international economies are currently going through a tremendously turbulent and confusing period. The recent economic trends have been a disappointment for both the Chinese and their trading partners, as Beijing continues to seek solutions to its mounting economic problems.

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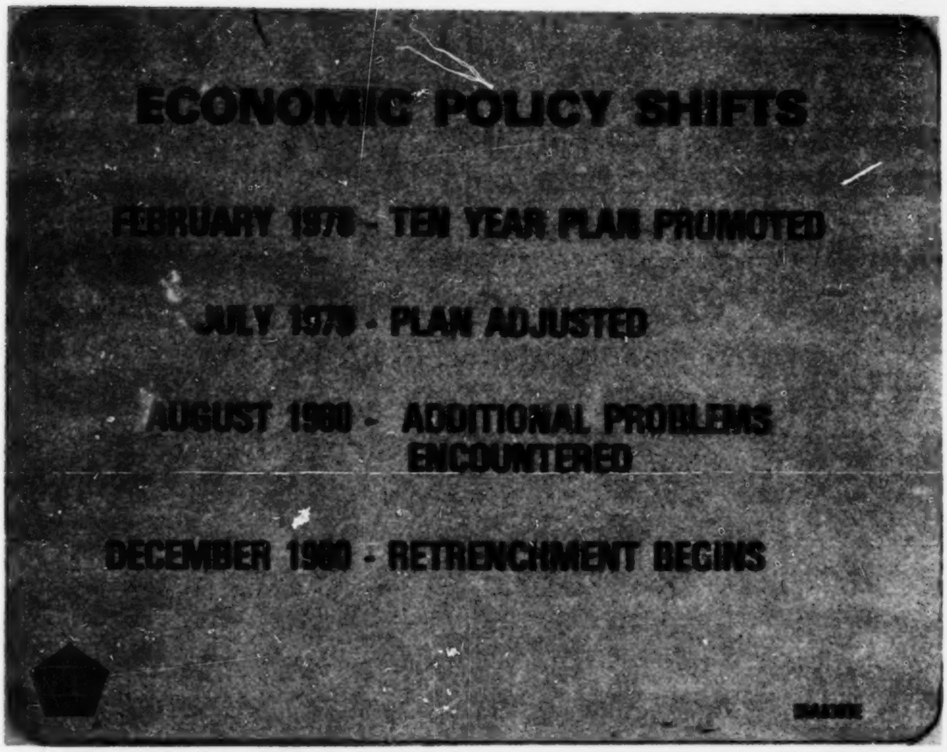

ECONOMIC POLICY SHIFTS

FEBRUARY 1978 - TEN YEAR PLAN PROMOTED

JULY 1979 - PLAN ADJUSTED

AUGUST 1980 - ADDITIONAL PROBLEMS ENCOUNTERED

DECEMBER 1980 - RETRENCHMENT BEGINS

In February 1978, then-Premier Hua Guofeng proclaimed that China would make tremendous economic advances by the end of the 1976–85 10 year plan. By July 1979, when the plan was discovered to be unachievable, Beijing redirected its priorities to more realistic goals, within a framework called the readjustment period. The centerpiece of this new policy was a shift away from heavy industry toward agriculture and light industry.

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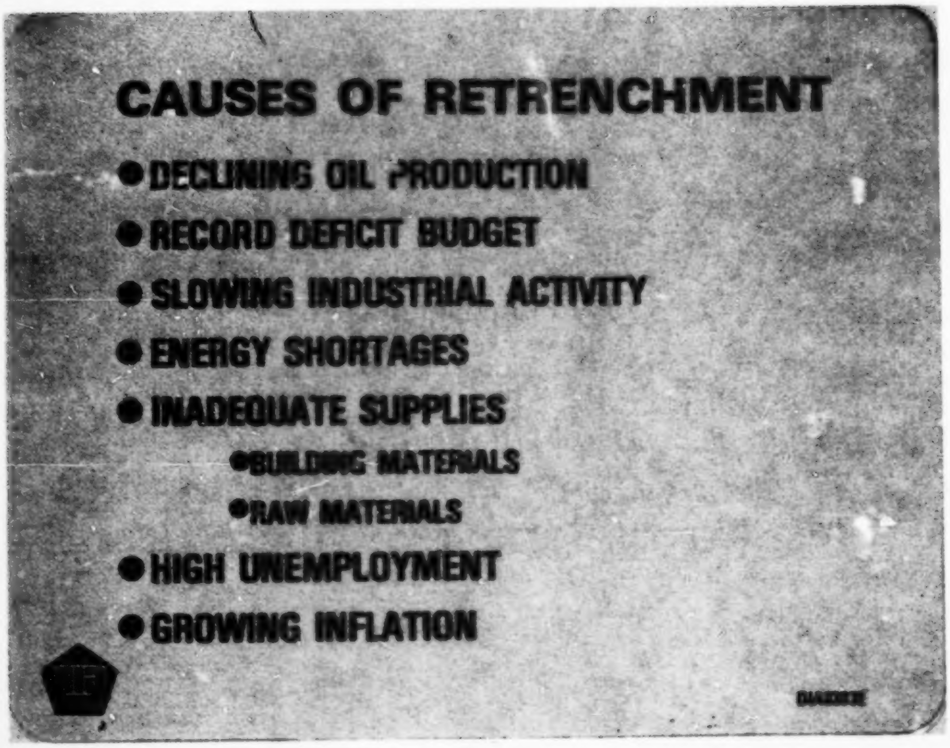

CAUSES OF RETRENCHMENT

- DECLINING OIL PRODUCTION
- RECORD DEFICIT BUDGET
- SLOWING INDUSTRIAL ACTIVITY
- ENERGY SHORTAGES
- INADEQUATE SUPPLIES
    - BUILDING MATERIALS
    - RAW MATERIALS
- HIGH UNEMPLOYMENT
- GROWING INFLATION

By the summer of 1980, however, it became evident to China's economic leaders that the economy was in serious trouble, and that the readjustment policies were insufficient. Consequently, in December of last year, Beijing's official policy shifted to more severe measures termed retrenchment.

The causes of the economic policy shift from readjustment to retrenchment are complex and, unfortunately for Beijing, not easily solved. During the summer of 1980, the top economic leaders announced that production of vitally needed oil would decline during the 1980–81 period. It was also disclosed that there was a record deficit budget in 1979, with additional deficits anticipated for 1980 and this year.

These problems were succeeded in the fall by a slowing of industrial activities, combined with a number of economic problems that had been persistent throughout the year—additional energy shortages, inadequate supply of building materials and raw materials, high unemployment, and growing inflation. All contributed to the dismal picture.

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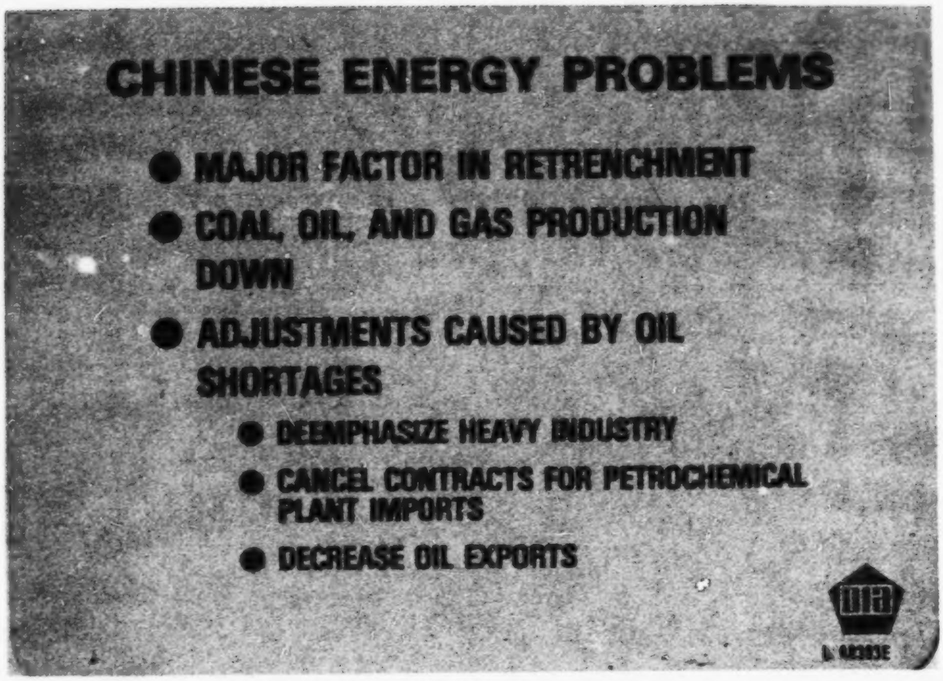

CHINESE ENERGY PROBLEMS

- MAJOR FACTOR IN RETRENCHMENT
- COAL, OIL, AND GAS PRODUCTION DOWN
- ADJUSTMENTS CAUSED BY OIL SHORTAGES
  - DEEMPHASIZE HEAVY INDUSTRY
  - CANCEL CONTRACTS FOR PETROCHEMICAL PLANT IMPORTS
  - DECREASE OIL EXPORTS

As mentioned previously, energy shortages—especially the declining oil situation—are a major problem in China, and a leading reason for the current retrenchment policies. In 1980, the Chinese output of all basic fossil fuels—coal, oil, and natural gas—fell slightly, ending a decade of steady and often spectacular growth. The oil industry especially is important to the four modernizations.

With oil production decreased, and not expected to increase for several years, Beijing has been compelled to minimize energy-consuming heavy industry, cancel the contracts for the importation of petrochemical plants, and decrease its oil exports, thus reducing foreign exchange earnings.

As is apparent, the oil industry is of paramount importance to economic modernization in China, and it is not living up to its previous expectations.

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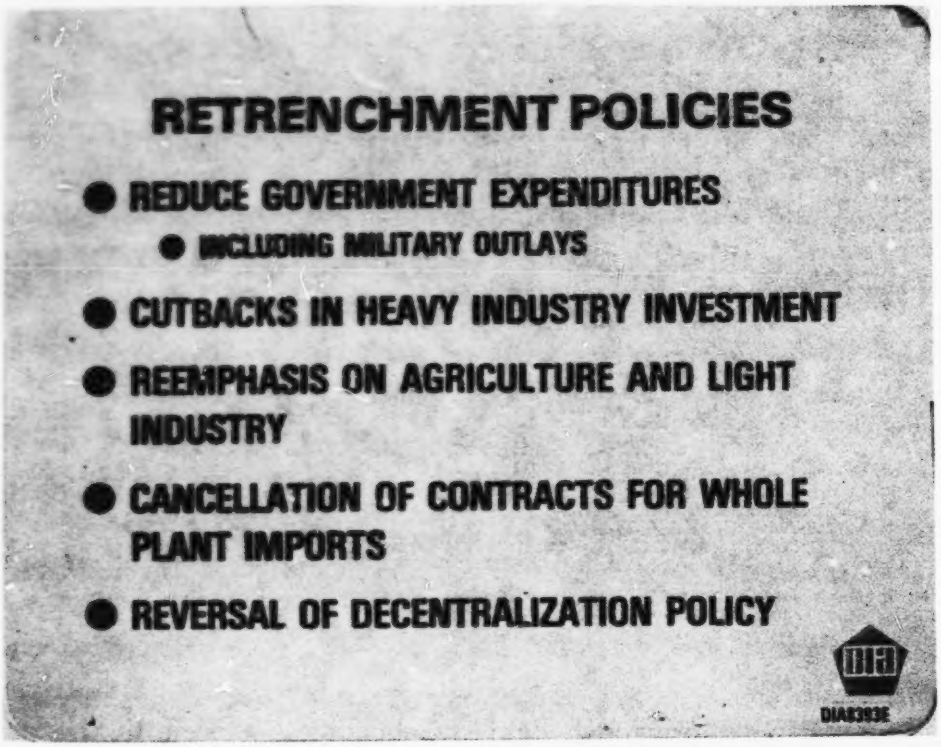

RETRENCHMENT POLICIES

- REDUCE GOVERNMENT EXPENDITURES
  - INCLUDING MILITARY OUTLAYS
- CUTBACKS IN HEAVY INDUSTRY INVESTMENT
- REEMPHASIS ON AGRICULTURE AND LIGHT INDUSTRY
- CANCELLATION OF CONTRACTS FOR WHOLE PLANT IMPORTS
- REVERSAL OF DECENTRALIZATION POLICY

DIA8393E

The retrenchment actions that began in December of last year, in Beijing's attempt to solve or at least alleviate these problems, are the economic policies currently in effect. Among the most important of these moves was to significantly reduce Government spending, including outlays for the military, between 5 and 20 percent. Related to this were cutbacks in investment in heavy industry, and the reemphasis on light industry and agriculture.

In addition, the cancellation of contracts for the importation of about $2 billion worth of industrial plants, combined with the reversal of the plans for economic decentralization, will have a direct impact on Chinese relations with the United States, other Western countries, and Japan.

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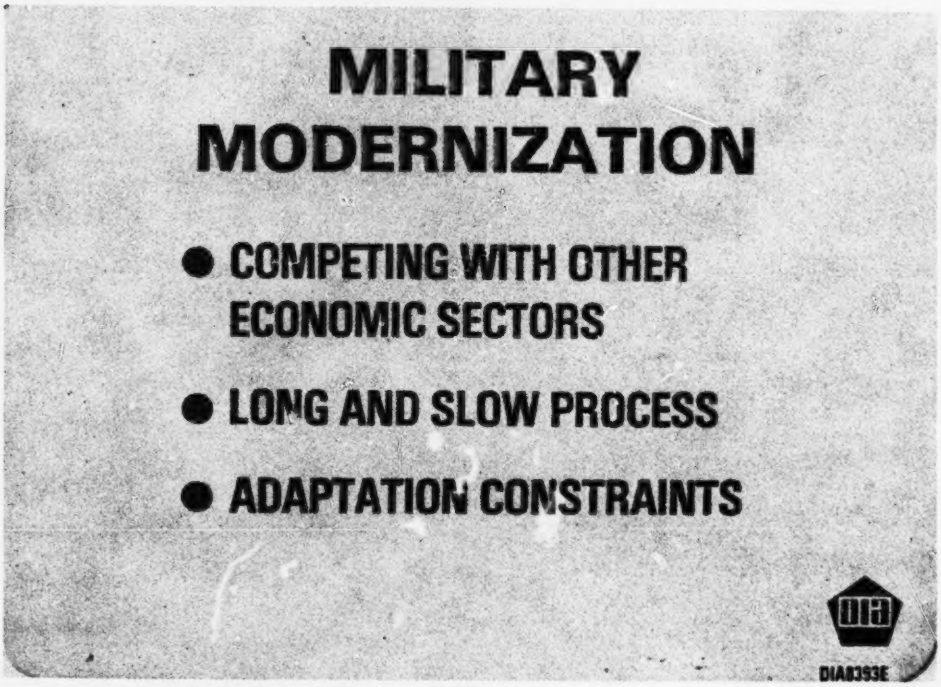

MILITARY MODERNIZATION

- COMPETING WITH OTHER ECONOMIC SECTORS
- LONG AND SLOW PROCESS
- ADAPTATION CONSTRAINTS

DIA8353E

An integral aspect of China's military modernization is the level and trend of defense expenditures. Prior to 1979, however, the Chinese did not disclose any figures for these outlays. Since then, data have been provided for the years 1977 through 1981.

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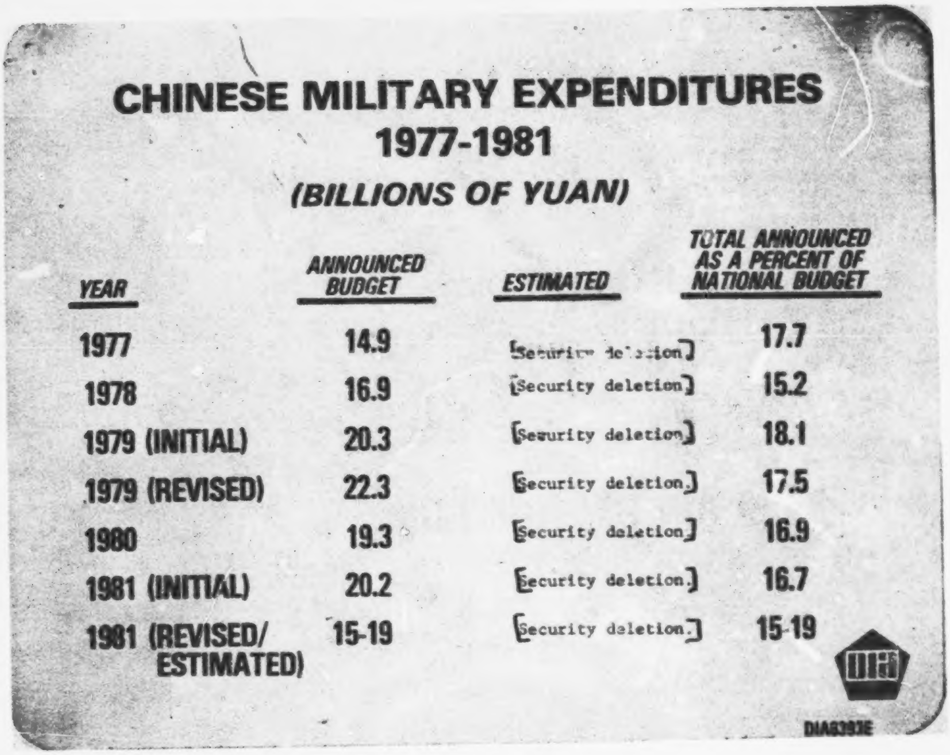

CHINESE MILITARY EXPENDITURES 1977-1981

(BILLIONS OF YUAN)

YEAR	ANNOUNCED BUDGET	ESTIMATED	TOTAL ANNOUNCED AS A PERCENT OF NATIONAL BUDGET
1977	14.9	[Security deletion]	17.7
1978	16.9	[Security deletion]	15.2
1979 (INITIAL)	20.3	[Security deletion]	18.1
1979 (REVISED)	22.3	[Security deletion]	17.5
1980	19.3	[Security deletion]	16.9
1981 (INITIAL)	20.2	[Security deletion]	16.7
1981 (REVISED/ ESTIMATED)	15-19	[Security deletion]	15-19

DIA8393E

Although there have been some revisions to initial announcements, and the 1981 figure has been changed to an estimated range, it is believed that this is a reasonable estimate of the trend in defense-related outlays. A major problem is that a significant portion of total military costs are not included in the announcements. The estimate of total Chinese defense outlays results in an expenditure series that is more than double that announced by Beijing, and is considered as the likely level of outlays for all aspects of the Chinese Armed Forces.

At this time, although no reliable dollar estimate is available for total expenditures, the annual procurement costs are about $5 billion. The initial 1981 announced defense budget is 16.7 percent of China's national budget, and 15 to 19 percent for the revised estimate.

Also, for comparison purposes, it is believed that the PRC's military costs, as a proportion of gross national product, are about 8 to 10 percent, compared to less than 6 percent for the United States and 14 percent for the U.S.S.R.

It can be expected that, given the limited resources and competing demands throughout the Chinese economy, military moderization will be a long and slow process. In addition, because of severe adaptation constraints, it is very unlikely that the Chinese would be able to fully utilize large imports of advanced foreign technology, if such imports became available.

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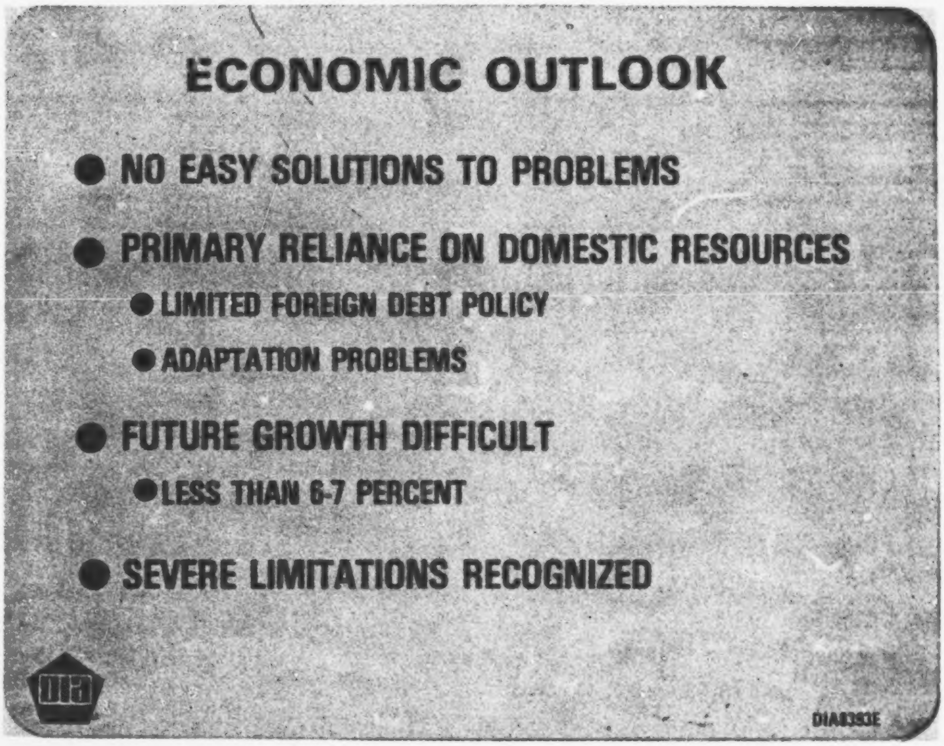

ECONOMIC OUTLOOK

- NO EASY SOLUTIONS TO PROBLEMS
- PRIMARY RELIANCE ON DOMESTIC RESOURCES
  - LIMITED FOREIGN DEBT POLICY
  - ADAPTATION PROBLEMS
- FUTURE GROWTH DIFFICULT
  - LESS THAN 6-7 PERCENT
- SEVERE LIMITATIONS RECOGNIZED

DIA8393E

Recent experience has now apparently convinced the Chinese leadership that there are no easy solutions for China's economic problems, and that it will take many years to achieve modernization. In addition, the prevailing policy of having only a limited foreign debt, combined with the acknowledged difficulties in utilizing large inputs of advanced Western technology, also mean that the Chinese must rely primarily on their own resources.

Beijing now also appears to recognize that future economic growth will be more difficult, and at least for the next several years will be significantly lower than the 6 to 7 percent rate of the 1970's. Even though Beijing has previously had grandiose schemes for repaid improvements, the economic leaders are now being forced to recognize China's severe limitations.

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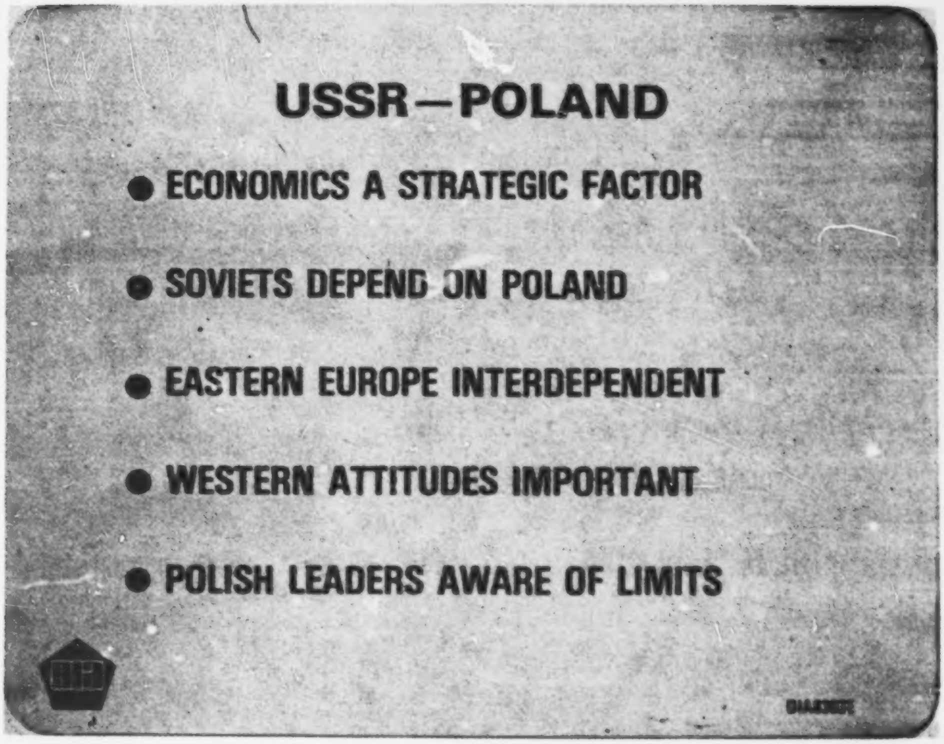

USSR—POLAND

- ECONOMICS A STRATEGIC FACTOR
- SOVIETS DEPEND ON POLAND
- EASTERN EUROPE INTERDEPENDENT
- WESTERN ATTITUDES IMPORTANT
- POLISH LEADERS AWARE OF LIMITS

I would now like to address very briefly some specific questions raised during the preliminary discussions on this hearing. Regarding the question of economic factors related to the Polish situation, we believe that Soviet economic trends account in part for the unprecedented restraint shown toward Poland in the past year.

Poland is a strategic country in the Soviet view for a number of reasons: proximity; its historical role as an invasion route; existence of lines of communication to the remainder of Eastern Europe; and its large standing army, to name a few. The strategic economic factor is becoming more clear now than it was previously.

Soviet industry relies, to a significant degree, on Polish exports, even including military items such a naval ships. In addition, Poland's economy is the largest of the non-Soviet Warsaw Pact countries, and these nations have developed a large degree of interdependence. Any significant long-term disruption of Polish output would have a very negative impact on the other Eastern European countries, most of whose economies are also not in good shape.

When the likely strong Western reaction to a military solution of the Polish crisis is considered, it is clear that the Soviets could ill afford a major confrontation with Poland. The participants in the Polish reform effort, on both the party and union sides, are aware of Soviet strategic interests and recognize that political and military considerations could at some point outweigh the constraints on Soviet action, including the economic constraints. However, they are doing their utmost to avoid crossing the threshold of Soviet tolerance.

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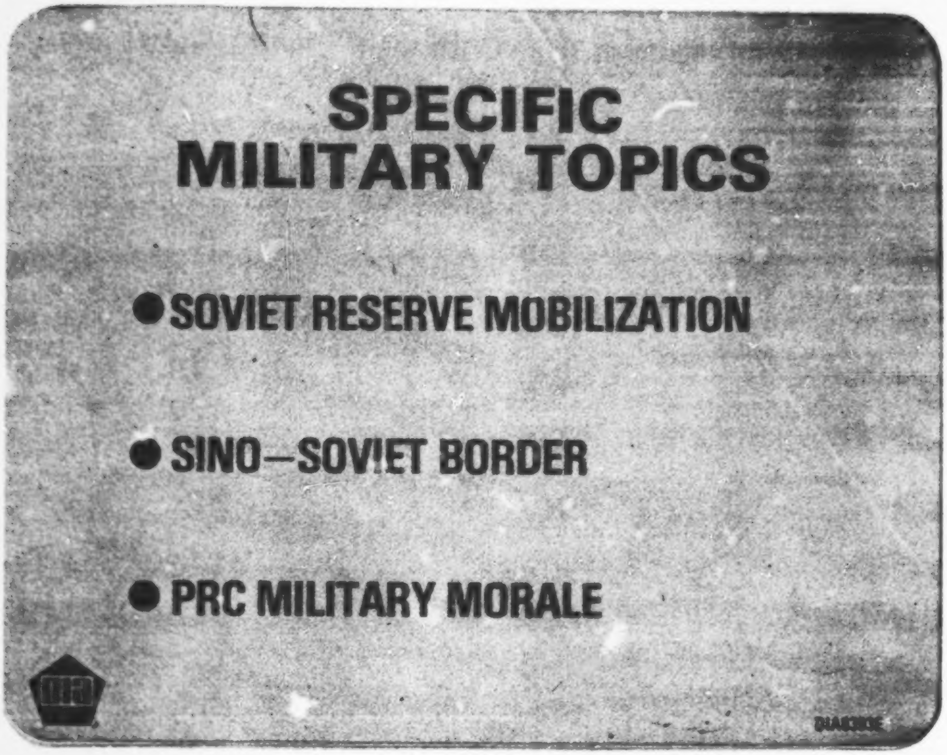

SPECIFIC MILITARY TOPICS

- SOVIET RESERVE MOBILIZATION
- SINO–SOVIET BORDER
- PRC MILITARY MORALE

To address the other questions; first, regarding the reports of problems in mobilizing Soviet reservists last year when frontline troops were temporarily moved to Poland [security deletion]. Reservist mobilization for combat duty in the Soviet military is not subject to significant disciplinary problems.

Second, I want to mention briefly the notable developments on the Sino-Soviet border during the past year. [Security deletion.] The level of manpower did not change significantly on either side, and neither gained a net advantage.

Third, the question of poor morale in the Chinese Army was raised. Morale in the Chinese Army has deteriorated, as the military no longer provides a higher living standard than the civilian sector. Chinese leaders are aware of the problem and have put more stress on ideological indoctrination in an attempt to deal with it. [Security deletion.]

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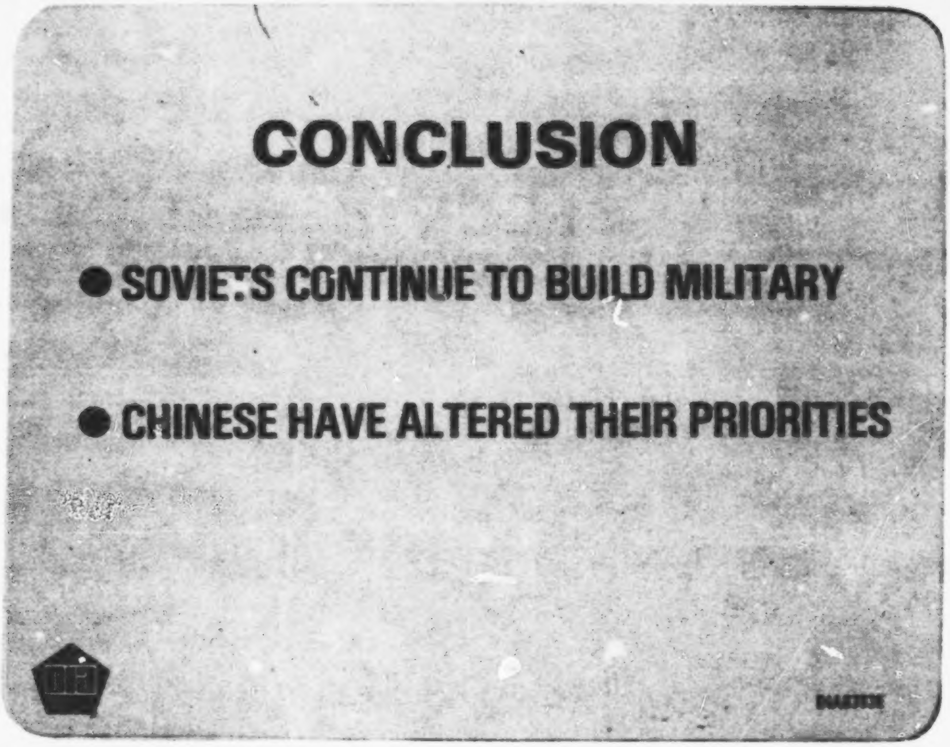

CONCLUSION

- SOVIETS CONTINUE TO BUILD MILITARY
- CHINESE HAVE ALTERED THEIR PRIORITIES

In conclusion, the responses of these two countries to military and economic difficulties are very different. While the Soviets continue to build their military strength in the face of declining economic growth, and have made preparations to expand the allocation of resources to the military, the Chinese have altered their priorities to deal more directly with the problems of long-term economic development, discounting any serious threat of war with the U.S.S.R. in the near future.

There is little prospect for improvement of relations between the two countries. Economic and political contacts are being maintained at a low level, but antagonism stemming from differences over ethnic, ideological, and territorial matters will continue to dominate Sino-Soviet relations.

Senator, this concludes our joint summary. We will be pleased to accept questions on the summary and any matter of interest of the subcommittee. Thank you, sir.

Senator PROXMIRE. Thank you very much.

[The joint prepared statement of General Larkin and Mr. Collins follows:]

JOINT PREPARED STATEMENT OF MAJ. GEN. RICHARD X. LARKIN AND EDWARD M. COLLINS

Resource Allocation Trends in the Soviet Union and China

1. INTRODUCTION

This statement examines economic and military resource allocation trends in the two largest Communist countries, the Union of Soviet Socialist Republics (USSR) and the People's Republic of China (PRC). Economic developments in both countries will have a major impact on decisions regarding the attainment of increased military strength in the future.

Soviet and Chinese leaders recognize that military power in the 1980's and beyond must be based on a highly developed domestic industrial system utilizing advanced technology. The prospects for economic growth in both countries suggest that constraints on the continuing buildup of military power are more significant currently than in the past decade.

The Soviet economy has steadily slowed its rate of advance from a very high peak during the recovery from the Second World War to very low growth rates at present. Trends in the labor force, investment, productivity, inflation, agricultural output, accessibility of raw materials, and the rising burden of client states all indicate that future economic growth will be very slow. Soviet leaders face difficult choices in this environment: a continued high priority for military power conflicts directly with securing economic growth at rates that will fulfill both domestic and foreign resource requirements. There has been no change in the rising trend of Soviet military outlays to date, even though the economic impact of those outlays is increasing. Judging by the draft guidelines for the Eleventh Five-Year Plan (1981-1985), the Soviet leadership has apparently opted for further growth in military strength as the standard of living of the population stagnates and even declines in some areas. The minor economic reforms being carried out at this time will improve the economic situation at the margin, but there is little prospect that growth can return to its former rates without major economic realignment. Soviet resource allocation priorities continue to reflect the traditional stress on military power, while the consumer has little chance for an improvement in living standards.

The Chinese economy is currently in a period which Beijing has termed "retrenchment." In an attempt to solve, or at least diminish, their numerous economic problems, the Chinese have significantly revised their priorities and have opted for a long-run approach to modernization. They have recognized there are no easy solutions to their problems and that the civilian sectors have precedence over the military. It can be expected that given the limited resources and competing demands throughout the Chinese economy, military modernization will be a long and slow process.

2. SOVIET ECONOMIC TRENDS

The Soviet Union completed its Tenth Five-Year Plan in 1980 and the traditional claim of "basic fulfillment" was made. The years 1976-1980 witnessed a major slowdown in economic growth and significant shortfalls below the expected production levels in virtually all areas of the economy. Economic growth was to have resulted from sharply increased productivity of both labor and capital in a period of increased "efficiency and quality." Few such increases occurred.

Using the Western concept of gross national product at constant prices, the Soviet economy grew only 14 percent during the Tenth Five-Year Plan (FYP), far below the goal of 27 percent. The amount of the shortfall increased sharply during 1979-1980, when GNP rose at a rate of just over 1 percent annually.

Of greater importance for assessing likely future actions are the Soviet data on economic performance. It is this set of data on which decisions by the Soviet leadership regarding resource allocation will be based. The performance of major economic categories according to Soviet data is shown below for the Tenth FYP. There are many more indicators used by Soviet specialists in judging economic trends, but the majority of them (largely based on gross value of output) are upwardly biased to show greater production than actually occurred. The effects of an increased amount of multiple counting of certain types of output, such as steel for engines that are finally installed in cars, and the ability to alter the product mix to raise prices, combine to discredit these other measures of output. Soviet specialists recognize the problems with these value measures and are altering the plan fulfillment reporting system to eliminate some of their shortcomings. The overstated measures, in conjunction with downward revisions of plans, are very useful politically, however. They allow the claim of plan fulfillment to be made with supporting documentation, however questionable.

The Soviet data indicate major shortfalls in most categories of physical output compared to the original goals. The fulfillment of incremental growth goals is a better indicator because it shows actual progress since 1975. Some of the more significant problems that led to the shortfalls are examined later.

There were some bright spots in the economy during the Tenth FYP. Output goals for natural gas, eggs, and cotton were basically met. The Baikal-Amur railway (BAM) opened some new areas of the eastern USSR to rail transport, though completion remains a long way off. However, it was difficult for even the self-congratulatory Party officials to identify very many areas in which true success was achieved.

Table 1

Soviet Plan Fulfillment; 1976-1980
(preliminary data)

Category	Original 1980 Goal (midpoint of range)	Actual Level in 1980	Percent Fulfillment
National Income (billion rubles, comparable prices)	457	437	96
Steel (million tons)	165	148	90
Oil (million tons)	630	603	96
Coal (million tons)	800	716	90
Natural Gas (billion m^3)	418	435	104
Cement (million tons)	145	125	87
Freight Turnover (trillion ton-kilometers)	6.7	6.2	93
Fabrics (billion m^2)	12.8	10.7	84
Meat (million tons)	15.3*	14.8*	97
Milk (million tons)	95*	90.7	96
Eggs (billions)	61*	67.7	111
Grains (million tons)	218*	205*	94
Tractors (million horsepower)	55	47	86
Harvesting Combines (thousands)	125	117	94
Cotton (million tons)	8.5*	8.9*	105

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*Average for 1976-1980

Table 2

Plan Fulfillment for Growth; 1975 to 1980
(preliminary data)

Category	Absolute Amount of Planned Growth 1975 to 1980	Absolute Amount of Actual Growth 1975 to 1980	Percent Fulfillment
National Income (billion rubles, comparable prices)	93	74	80
Steel (million tons)	24	7	29
Oil (million tons)	139	112	81
Coal (million tons)	99	15	15
Natural Gas (billion m^3)	129	146	113
Cement (million tons)	23	3	13
Freight Turnover (trillion ton-kilometers)	1.5	1.0	67
Fabrics (billion m^2)	2.8	.7	25

a. Industry

Conditions in the country's industrial sector, the traditional pacesetter, reflect an unusual degree of disruption from bottlenecks and poor labor productivity. Industrial growth (Western concept) slowed from 5.9 percent annual growth in 1971-1975 to only three percent in 1979-1980. This decline in growth was highlighted last year by extreme shortages and delays of materials and products essential to both civil and defense production. Throughout the year production shutdowns became critical at a number of plants. These shortfalls were attributed to lack of materials, including metals, fuel shortages, and transportation disruptions. In many cases, chaotic conditions in the Soviet rail system were responsible for the disruptions. The need to move large quantities of grain and potatoes as well as coal on a priority basis imposed a great strain on scarce rolling stock. The massive shift by Iran's suppliers to rail delivery via the USSR partially accounts for the critical lack of rolling stock, as do heavy rail shipments to Afghanistan to support Soviet troops and the Afghan economy. The combination of rail bottlenecks, rolling stock shortages, and lack of materials became self-reinforcing and had an impact on all manufacturers.

The underlying reasons for these developments are directly related to Soviet investment decisions throughout the 1970's which consistently directed capital to heavy industry, especially the machine building sector with its large defense output. While Soviet military output has always had first priority, the cost of denying resources to the transportation, energy, chemical, agricultural machinery and food processing sectors is now being felt.

An additional factor is the failure of civilian science and technology to achieve the expected result of greatly increased capacity from new machinery and equipment. Changes in financial arrangements covering research and development costs have not been effective in reducing producer's reluctance to adopt new methods and products. Further stress on financial methods is not likely to improve the situation significantly.

b. Agriculture

At the forefront of the deteriorating economic situation has been the further decline in food availability in an economy where such shortages were already common. After years of increased stress on agriculture, the Soviet Union is facing the worst food situation the Brezhnev regime has ever experienced. More importantly, food shortages are the most severe in the memory of that vast majority of Soviet workers whose adult experience is confined to the past twenty years.

The poor crops in 1979 and 1980 were caused by numerous factors other than bad weather. Fertilizer production shortfalls, failure to remedy the problems of repair that have kept as much as 50 percent of harvesting equipment idle, the lack of incentives for maintenance that makes it necessary for 80 percent of new Soviet tractor supplies to go for replacement of retired tractors in some areas, inadequate storage facilities, and the unavailability of covered railcars for transportation are some of the problems.

The availability of meat and dairy products at state stores is normally erratic and long lines are common. However, meat has now virtually disappeared in many urban as well as rural areas and even staple foods are increasingly scarce. Food shortages triggered work stoppages at the Togliatti and Gorkiy auto and truck plants in May 1980 and similar incidents reportedly occurred in other regions through early 1981.

Soviet efforts to partially offset food shortages through continued massive imports has led to record purchases of grains, meats, wheat flour, butter and other products. The importation of record levels of processed foods shows that the Soviet crop failures were impacting directly on consumers and not just the livestock sector as has often been the case in the past.

Table 3

Soviet Grain Imports
(millions of metric tons)

1976/77	1977/78	1978/79	1979/80	1980/81
10	18	15	30	35

Rising food purchases, both for domestic consumption as well as for client states, has also led to record hard currency outlays as shown in the following table.

Table 4

Soviet Hard Currency
Food Imports
(billions of dollars)

1979	1980	Projected 1981
$5	$8.5	$12.0

c. Labor Force

At the same time that material resources are strained, the labor force outlook is also poor. Demographic factors are responsible for a steady decline in increments to the working age population. Whereas about 2 million persons joined the labor force each year from 1976 to 1980, this increment will average only 600,000 annually during the Eleventh FYP and the addition will be only 400,000 in 1985.

Ethnic and regional imbalances will further complicate this problem, since the less educated and basically rural non-Russian populations of Central

Asia and the Transcaucasian republics are growing much faster than the Russian ethnic groups.

Table 5

Increments to Soviet Working
Age Population
(million persons, annual average)

1971-1975	1976-1980	1981-1985	1986-1990
12.7	11.1	3.2	2.5

However, the real labor problem is not absolute lack of manpower, but extremely low productivity. By Western standards there is serious overmanning in all economic sectors. Overstated Soviet estimates put labor productivity in industry at 56 percent of the US level, while agriculture is put at only 20 to 25 percent. This is partially because over half of workers in industry, construction, and agriculture work manually. However, more capital input per worker has not and will not automatically turn around the situation. Manhours lost to harvest support, low morale, and alcoholism would also have to be substantially reduced in order to overcome the negative manpower trends. These factors have resulted in a steady drop in the growth of industrial labor productivity (Western concept) from a 4.5 percent annual rate in 1971-75 to less than one percent in 1979.

Table 6

Decline in Growth of Soviet Industrial
Labor Productivity
(average annual percentage)

1971-1975	1976-1977	1978	1979-1980
4.5	2.2	2.1	1.0 (preliminary)

d. Failure of Economic Strategy

The decline in productivity growth throughout the 1970's has occurred during a period when the leadership pursued a policy designed to achieve the opposite result. The formula was one by which wages were to be increased as an incentive for harder, higher quality work. The plan failed when the regime was not able to provide the food and other consumer goods to even approach satisfying demand. This pent-up demand is illustrated by the growth of savings deposits at a rate of over 11 percent annually during 1975-1980, in sharp contrast to wage increases of roughly 3 percent annually.

Table 7

Individual Savings Deposits
(billions of rubles; current prices)

1975	1976	1977	1978	1979	1980 (Est.)
91.0	103.0	116.7	131.1	146.2	157

e. Client States

Over the past decade a significant factor hampering growth has been Moscow's need to constantly increase its economic commitment to other Communist regimes, further straining its own limited resources. Soviet aid of all kinds rose from nearly $2 billion in 1971 to nearly $24 billion in 1980. The types of aid included here are subsidies on exports (oil to Eastern Europe, for example) and imports (sugar from Cuba), trade credits at favorable rates, normal economic aid, and military aid. Economic support to Cuba alone since 1960 totals about $20 billion, double that actually provided to all of the Soviet's Free World aid recipients. Most of this has been provided in the past five years as Castro's economic plans have failed. Much of this support was intended to be partially repayable in sugar and nickel. However, Cuba's inability to produce enough of these commodities means that the $3 billion a year Moscow is pouring into Cuba will actually end up as grant aid.

Similarly, Vietnam's demands for food, oil and industrial supplies are proving to be far more than Moscow could have envisaged. The complete loss of Chinese and Free World aid in 1978 and the collapse of the war torn Indo-Chinese economies has caused a doubling of Soviet aid to these clients to about $1 billion annually.

The shipment of Soviet food, fuel and other goods to Afghanistan to shore up that Communist government as well as for its own troops is another mounting drain that could increase if guerilla resistance cannot be quelled.

The unexpected Polish crisis has forced Moscow to provide several billion dollars in goods and hard currency to Warsaw in an effort to stabilize that regime. This is clearly an open ended commitment as the Soviets are prepared to run a significant trade deficit with Poland, as disguised aid, for the next five years. Of course, far heavier costs are implied should a Soviet military intervention in Poland occur.

f. Foreign Trade

Substantial earnings from the sale of energy, military equipment, and gold gave the USSR an estimated current account surplus of over $2 billion in 1980 despite a deterioration in overall hard currency trade. The Soviets overall hard currency trade deficit was $2.5 billion last year, slightly worse than the $2.0 billion in 1979 but substantially better than the annual deficits of roughly $6 billion of a few years ago. Most of the increases in imports last year were a result of larger purchases--at higher prices--of grain, soybeans, sugar, and meat from non-US suppliers. The $4.2 billion gain in export revenues was due entirely to soaring oil and natural gas prices. The value of nonenergy exports dropped. So long as energy prices remain high, Soviet hard currency needs will be met. The relationship between energy and hard currency is covered in the "Energy" section below.

Table 8

USSR: Hard Currency Trade
(million US $)

	1979			1980		
	Exports	Imports	Balance	Exports	Imports	Balance
Total	19,549	21,585	-2,036	23,792	26,247	-2,455
Argentina	38	442	- 404	47	1,790	-1,743
Australia	8	602	- 594	9	1,194	-1,185
Canada	49	694	- 645	46	1,496	-1,450
France	2,182	1,832	350	3,453	2,326	1,127
Italy	1,977	1,321	656	3,235	1,438	1,797
Japan	1,445	2,530	-1,085	1,463	2,730	-1,267
United Kingdom	1,672	1,240	432	1,323	1,467	- 144
United States	535	3,805	-3,270	233	2,081	-1,848
West Germany	3,394	3,496	- 302	4,767	4,603	164
Other	8,249	5,623	2,626	9,217	7,122	2,095

g. Capital Investment Trends

A major component of Soviet economic growth strategy has been to create massive amounts of new fixed capital for the labor force to utilize in raising output levels. Capital investment has consistently absorbed over one-fourth of Soviet economic output during the post-war years and has risen as shown below.

Table 9

USSR: Capital Investment
(billions of rubles; Soviet comparable (mixed) prices)

	1965	1970	1975	1978	1979	1980 (Preliminary)
Total Capital Investment	56.0	80.6	112.9	129.7	130.6	133.5
Average Annual Increase (%)	-	7.5	7.1	4.6	.7	2.3

Capital investment growth slowed dramatically in the late 1970s in accordance with the stress on efficiency incorporated in the Tenth Five-Year Plan. The expected rise in output per unit of capital (the output-capital ratio), did not occur as planned. In fact, the deterioration of the output-capital ratio amounted to nearly one third during the 1970s for the economy as a whole.

Soviet economists point to numerous factors that contributed to the falling productivity of capital: the need for extensive retooling of old equipment; worsening conditions for extracting minerals, petroleum, and other raw materials; increased investment in environmental protection equipment; poor results from large investments in agriculture; and, the failure of the work force to take advantage of the new equipment to raise productivity.

A contributing factor in the decline of output received per unit of capital is the continuing rise in unfinished construction. The Tenth Five-Year

Plan envisaged a large drop in the ratio of unfinished construction to annual capital investment. The results indicate that the ratio actually rose from 75 percent in 1975 to roughly 90 percent in 1980. (Ekonomicheskaya Gazeta, No. 5, 1981.) There exists a stock of unfinished projects that, if completed according to plan, would have added nearly five percent to output in 1980. Part of this problem was that out of 2,700 completed projects during 1976-1979, only one third were finished on schedule. (Yu. Kuzmich, Ekonomika Stroitelstva, 1981, pp 42-43.)

As noted in the section on "Soviet Inflation", there have been widespread increases in costs and prices throughout the Soviet economy. The construction sector has experienced severe inflation in many areas, with costs increasing by as much as one hundred percent over original estimates. (T. Khachaturov, Voprosy Ekonomiki, No. 7, July 1979.) In part, this reflects design errors, but the incentive system also leads directly to large cost overruns in a manner similar to those that occur elsewhere in the Soviet economy: the more expensive the inputs, the greater the bonuses for completion.

The effect of this on Soviet capital investment and stock value data is to overstate the actual worth of the capital. Soviet data on capital values are in mixed prices reflecting values as of 1973 for assets then in existence and the actual current prices for capital created since that time. (B. Plyshevskiy, Voprosy Ekonomiki, No. 2, February 1981.) With prices on construction and equipment rising substantially faster than the productive capacity of the new capital, it is clear that output per unit of that capital stock must fall over time.

This is not a new problem in the Soviet economy: during the period 1950-1962 prices for machine tools, a basic component of industrial investment, rose 65 percent per unit of capacity; the cost of machinebuilding equipment rose five percent annually between 1959 and 1967; and, the unit cost of new output capacity for a wide range of homogeneous products rose by an average of 5 to 6 percent annually during 1971-1975. (V. P. Krasovskiy, Planirovaniye, 1970; V. Faltsman, Voprosy Ekonomiki, No. 8, August, 1980.) There was still real growth in the annual additions to fixed capital, however, because the value of investment rose more rapidly than costs per unit of capital production capacity. This set the stage for further economic growth at respectable rates.

This is no longer the case. According to V. Faltsman,

> during the Tenth Five-Year Plan (1976-1980) the fall in the capacity equivalent (productivity) for invested capital will take place more rapidly than during the Ninth Five-Year Plan (1971-1975)....Under these conditions, average annual rates for the fall in the capacity equivalent will reach 6 to 7 percent and will exceed growth rates for capital investments and fixed capital. (Faltsman, op. cit.)

The meaning of these trends is that even though the value data indicate substantial increases in additions to fixed capital in recent years, the increments to the capital stock in at least some sectors are falling in real terms. While further research is necessary to define these trends more precisely, it is clear that the rising costs of capital are driving Soviet economic growth potential downward from its already low level.

Preliminary data on increases in fixed capital in nominal and deflated terms are provided below.

Table 10

Soviet Capital Stock Increments
(billions of rubles)

	1976	1977	1978	1979
Nominal Growth in Capital Stock	89	92	100	101
Growth Deflated @ 6%	84	82	84	80

The data from Faltsman, if generalized to all capital investment for the entire Tenth Five-Year Plan, indicate that real additions to the capital stock fell by five percent between 1976 and 1979, and little sign of progress in this area has been noted for 1980.

In sum, the real quantity of new capital added to the Soviet production base annually has not been rising at nearly the rate shown by the raw data, and may have actually been declining in recent years.

h. Soviet Inflation

Evidence on inflationary pressures in the Soviet Union indicates widespread increases in costs and prices, as well as significant amounts of repressed inflation. The basic causes of these movements are rising costs of production due to the deteriorating accessibility and quality of natural resources, higher costs of new technology, and the nature of the Soviet economic incentive system. These trends have been recognized, to some degree, in the discussions of the major price reform which is occurring at this time. This section examines some of the available data on cost increases and price changes in four sectors of the economy to indicate the extent of inflationary pressure in the Soviet Union. These pressures are not always directly reflected in overt price increases, but they do result in deleterious economic effects.

(1) Agriculture

The Soviet leaders take great pride in asserting that retail prices for food have not risen in recent decades. (N. Glushkov, *Current Digest of the Soviet Press*, Vol. XXIX, No. 6, p. 9.) There have been selected increases, such as on July 1979 when restaurant prices were raised 25 to 45 percent and beer in public catering establishments increased in price by 45 percent. (*Summary of World Broadcasts*, SU/W1039/A/2, 6 July 1979.) However, the overall level of retail food prices in state trade has been increasing at a very gradual pace. The official Soviet retail price index for food is shown below. This official index understates the rate of price change in state stores by a small amount due to the nature of the sample used in the calculation.

Table 11

Official Soviet Index of State Retail Food Prices

	1975	1976	1977	1978	1979
(1970 = 100)	100.9	100.9	100.9	102	102

Sources: NK 79, p. 469; N. Glushkov, Kommunist, 22 May 1980, pp.45-49.

This degree of price stability is in sharp contrast to the conditions existing in the unregulated collective farm market in Moscow, where food prices rose 6.3 percent per year during 1970-77. (B.S. Severin, "USSR: The All Union and Moscow Collective Farm Market Price Indexes," in ACES Bulletin, Vol XXI, No. 1, Spring 1979, p. 27.) Price rises have become more rapid following the poor harvests of 1979 and 1980.

State retail prices are held virtually constant in the face of upward pressure only through large subsidies from the state budget. The government has increased the prices at which it purchases agricultural goods from kolkhozes and sovkhozes by 50 percent since 1965, including a five percent rise in 1980. (A. Stolbov, Selskaya Zhizn, 23 June 1979, p. 2; 12 February 1981, p. 2.) The budget absorbs the difference between these rising prices and the nearly stable retail prices. The amount of subsidies on agricultural products in recent years are presented below. These subsidies have grown by nearly seven percent per year during the 1970s and now account for roughly 10 percent of total government budget outlays.

Table 12

State Budget Subsidies on Agricultural Products
(billions of current rubles)

1969	1970	1975	1978	1979	1980
7.88	14.33	19	22	26	30(Est.)

Even these large sums are not sufficient to provide adequate resources to the agricultural sector while maintaining stable retail prices. There is an additional subsidy from the state budget to cover the difference between the enterprise wholesale price of machinery and equipment and the price at which Selkhoztekhnika (State Committee for the Supply of Equipment to Agriculture) sells it to the kolkhozes and sovkhozes. In 1976 the subsidy amounted to 1.9 billion rubles, and in 1980 the total was set at over 4 billion rubles. (R. Gumerov, Planovoye Khozyaystvo, March 1979, p. 84-93; N. Glushkov, Planovoye Khozyaystvo, June 1980, pp. 3-14.)

While these subsidies allow agricultural prices to remain nominally low, the impact of the cost/price rises is still felt throughout the economy. The budget revenues from other sectors of the economy have to be raised by enough to cover the subsidy to agriculture.

> Naturally, there are no free things: they are paid for with profits of state enterprises, incomes from state commercial transport, communications, trade, and so forth. (G. Pisarevsky, APN Weekly Review, 13 July 1978, pp. 1-3.)

The effects of this financial sleight-of-hand are described below.

> Compensations for the growth in material outlays through increased procurement prices to some extent promote the normalization of conditions for expanded reproduction in agriculture, but cause corresponding changes in the level of material outlays in the processing sectors, increased rates for services rendered by sectors in the circulation sphere and the infrastructure, and in the final event give rise to a tendency towards hidden increases in retail prices. (V. Tikhonov and M. Lezina, Voprosy Ekonomiki, January 1979, p. 89-90.)

Production costs have risen fairly steadily for most agricultural products as shown below. The one partial exception is the production of eggs, where mechanization has been most successful. Weighted according to 1965 prices and quantities, the average annual increase during the 1965 to 1979 period was over 3 percent.

There are a number of factors causing rapid increases in the cost of agricultural production. An example of such trends is provided below.

> The branches of sphere I of the AIC (agro-industrial complex) frequently unjustifiably increase prices of the means of production which are supplied to agriculture. For example, the prices for the new types of K-700 and K-701 tractors per unit of engine capacity are 30 to 40 percent higher than the prices for the same tractors of previous models. The prices for new trucks per ton of load capacity are also 20 to 40 percent higher than for the trucks at the beginning of the 1960s. In 1971-75 the cost of a single livestock "place" which had been built on the country's sovkhozes was 4.7 times higher than in 1961-65.
>
> Prices for new means of production have to be established strictly with regard to the effect of their use. An increase in prices must not outstrip the increase in the productivity of the corresponding means of production. (N. P. Fedorenko, Ekonomika i Matematicheskiy Metody, May-June 1979, pp. 444-453.)

Another important input to meat production, cattle feed, rose 69 percent in cost between 1970 and 1979. (Zhivotnovodstvo, No. 11, November 1980, p. 6.)

The relative growth rates of output and fixed assets in agriculture during the 1970-1979 period points out the problem even more clearly: during these years, the value of output rose 14 percent, while the value of fixed assets increased 124 percent. (NK 79, pp. 223, 231.)

Overall, material outlays on production (in current prices) per ruble of gross farm output (in comparable 1973 prices) rose an average of over 5 percent per year between 1966 and 1977. A contributing factor to the cost increases has been the rise in wages per unit of output. Wages per ruble of output rose from

Table 13

Cost of Production of Basic Agriculatural Products
(rubles per ton of output or weight gain)

	Kolkhozes				Sovkhozes			
	1965	1970	1975	1979	1965	1970	1975	1979
Grain	50	50	69	77	66	53	94	81
Raw Cotton	325	404	433	474	291	362	439	512
Sugar Beets	21	22	29	32	27	29	40	43
Potatoes	46	62	80	93	61	76	93	117
Vegetables	85	94	111	119	72	84	98	107
Cattle	1,017	1,166	1,574	1,981	1,052	1,277	1,842	2,176
Hogs	1,152	1,194	1,487	1,855	1,067	1,111	1,489	1,638
Sheep	660	801	1,053	1,288	612	736	1,048	1,267
Milk	160	177	217	268	163	189	247	291
Chicken (per 1,000)	78	73	74	85	75	63.9	60	63 Eggs
Wool	3,201	3,862	5,311	6,722	2,907	3,585	5,373	6,309

Sources: Narodnoye Khozyaystvo 1965, pp. 408, 428 (cited hereafter as NK followed by the year to which the book pertains); NK 70, pp. 387, 399; NK 75, pp. 417, 437; NK 79, pp. 289, 306.

31.7 kopeks to 35.2 kopeks on kolkhozes and from 28.5 kopeks to 34.1 kopeks on sovkhozes during the period cited above. (Gumerov, op cit., p. 8.) During 1970-79, production costs in agriculture rose by "20 to 30 and more percent." (T. Khachaturov, Voprosy Ekonomiki, No. 7, July 1980.)

Financial manipulations such as subsidies cannot prevent such cost increases from being passed on to other sectors of the economy.

(2) Extractive Industry

As economic development occurs in any economy, the cheapest and most accessible resources are utilized initially, with more expensive resources being brought on line as time goes on. This is true in the Soviet Union as well as in market economies.

> In our country (the Soviet Union) fuel and energy resources are distributed very unevenly -- 90 percent are east of the Urals in unpopulated regions with extremely harsh natural and climatic conditions. The remaining 10 percent are in the European part of the USSR where over three-fourths of the country's productive forces are concentrated...
>
> The era of cheap energy has come to an end. Fuel is being acquired only with increasingly great labor and capital expenditure. While in 1975 expenditure on ancillary construction per oil borehole was 141,000 rubles, in 1980 it is expected to be 185,000 ruble -- 30 percent more.
>
> Another reason for the rise in the cost of extracting fuel is the depletion of rich deposits...To compensate for the inevitable future decrease at Samotlor as a result of the exhaustion of stocks, it will be necessary to exploit dozens of new deposits...Capital expenditure will naturally have to be increased considerably.
>
> It is the same with gas...Capital investment in ancillary construction for fields at the Medvezhey, Urengoy, and Vyngapur deposits is 19.14 rubles per thousand cubic meters of gas extracted, while...in the Uzbek SSR they were almost four times less. Gas transportation costs have tripled. While, for instance, one kilometer of the Central Asia-Center gas pipeline cost 300,000 rubles, one kilometer of the Urengoy-Chelyabinsk gas pipeline of the same diameter costs 867,000 rubles.

> In the coal industry...Whereas during the Eighth Five-Year Plan capital investment in commissioning new capacities in the Donetsk coal basin was 34.2 rubles per ton of coal, it has now reached 50-55 rubles. (E. Vertel, Sotsialisticheskaya Industriya, 10 August 1979, p. 2.)

The coal industry is a particularly good example of this phenomenon. During 1968-73, operating costs per ton of coal output in the Ukraine increased by .8 percent per year followed by a further rise of 5.6 percent per year in 1974-77. This was accompanied by a reduction in the quality of the coal produced. While the physical amount mined increased by 133.8 million tons between 1965 and 1976, the "standard fuel equivalent" value rose by only 66.5 million tons. (P. Tkachenko, Ekonomika Sovetskoy Ukrainy, July 1979, p. 79-80.)

Cost trends for electricity and fuel production are shown below. While these cost trends have only been partially incorporated into prices charged to industrial users and consumers, the deteriorating level of utilization of material resources has had an adverse impact on efficiency, lowering the output-capital ratio, or the amount produced per unit of value of buildings and equipment, throughout the economy. (V. P. Loginov and M. N. Sidorov, Izvestiya Akademii Nauk SSSR --Seriya Ekonomicheskaya, May-June 1979, pp. 15-25.)

Table 14

Trend in Outlays (Cost) per Unit of Marketed Output
(1970 = 100)

	1970	1975	1976	1977	1978	1979
Electrical Energy	100	102.6	102.7	102.9	101.7	102.9
Fuels	100	101.0	102.2	103.5	105.4	108.0

Sources: NK 76 p. 195, NK 79, p. 162

An indication of how domestic prices for extracted materials will change in the very near future to reflect these trends is provided by A. Komin, Deputy Chairman of the State Committee on Prices. (Planovoye Khozyaystvo, May 1980, pp. 33-43.) In referring to the upcoming wholesale price revisions in 1981 and 1982, Komin noted that

> for the purpose of eliminating unprofitability in the coal and timber procurement sectors and in the production of thermal power, it will be necessary to raise wholesale prices for coal by 42 percent, commercial timber by 40 percent, and rates for heat and power by 70 percent.
>
> ...Higher prices for fuel will affect outlays in power, ferrous and nonferrous metallurgy, and the construction materials industry....Thus, rates for electric power ought to be increased by 12 percent, the level of wholesale prices in ferrous metallurgy by 20 percent, and in nonferrous metallurgy by 14 percent. In view of raising prices for commercial timber, prices should also be raised for the pulp-and-paper and the wood-processing industry.
>
> Higher wholesale prices for fuel, raw, and other materials will result in increased costs not only in industry but also in other sectors and spheres of the national economy: construction, agriculture, transport, and the nonproductive sphere.

A further indication of the expected future rise in fuel costs is provided below.

Table 15

Change in the Cost of Fuel in the Future
(European USSR Costs in 1979 = 100)

	in European USSR		in Siberia	
	Coal	Electric Power	Coal	Electric Power
Short-Term	100	100	12-15	55-65
Medium-Term	120-150	110-120	25-30	65-75
Long-Term	165-175	115-125	30-35	75-85

Source: R. T. Semina and L. I. Tatevosova, Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya, September-October 1979, pp. 50-59.

Rising costs have caused large losses at coal mining enterprises, which have been covered by budget subsidies. As in the case of agriculture, such financial manipulations merely spread the impact of the cost increases indirectly rather than through overt price increases. The new prices for fuel in the coming years will overtly reflect these inflationary factors.

In 1978, retail prices for fuel were raised sharply, roughly doubling for gasoline. This was the latest in a series of price increases for fuel. These price rises have been in the form of turnover (sales) tax increases rather than rises in the prices paid to producers directly. These taxes are then funneled back to the producing sectors as subsidies and capital investment funds. The table below provides comparative data on Soviet official wholesale prices with and without the turnover tax to illustrate the difference in trend as reflected in this downward-biased index.

Table 16

Wholesale Price Indexes For Energy
(1949 = 100)

	1950	1965	1967	1975	1978	1979
Without Turnover Tax:						
Electric Power	92	62	83	83	79	79
Fuel	95	76	132	131	131	131
With Turnover Tax:						
Electric Power	92	70	80	80	80	80
Fuel	92	74	104	113	127	127

Sources: NK 78, pp. 138-139; NK 79, pp. 164-165.

Similar trends have appeared in the timber industry, and in 1979 domestic furniture prices were increased by 10 percent as a result. (N. T. Glushkov, Izvestiya, 1 July 1979, p. 2.)

(3) Transportation

Costs have also increased in the Soviet transport system in recent years. Data on the cost trends in motor, rail, and water transport have become more scarce since the Soviets dropped the previously published table on transport costs from the 1976 and later editions of Narodnoye Khozyaystvo. Cost trends through 1975 are provided below.

Freight transport in the 1970-1975 period rose in cost by 10.08 percent per year, using 1970 quantity weights for the types of transport covered in the table. Passenger transport costs increased 7.28 percent per year during the same period.

These cost trends have not yet affected the rates charged for transport. The price revisions in 1981 and 1982 will have to take into account the negative profitability trends which have also developed since 1970, as shown in table 18. Eventually, the cost increases will result in either large subsidies or overt price rises in the transport sector.

(4) Machinebuilding

The machinebuilding and metalworking sector (MBMW) produced 27.9 percent of gross industrial output in the Soviet Union in 1979. This included investment goods such as machinery and equipment, consumer durables, and

Table 17

Cost of Shipments by Type of Transport
(in current prices)

	1965	1970	1975	Total %Change 1970-1975
Freight Transport (kopeks/ton-kilometer)				
Rail	2.402	2.341	2.478	5.9
Sea	1.38	1.46	1.98	35.6
River	2.38	2.45	2.59	5.7
Motor	61.11	57.13	50.51	-11.6
Passenger Transport (kopeks/passenger kilometer)				
Rail	5.979	5.455	6.063	11.1
Sea	35.65	47.18	64.03	35.7
River	13.06	15.51	17.53	13.0
Motor	9.81	9.85	10.04	1.9
Combined Transport (kopeks/ten adjusted ton-kilometers)				
Rail	2.737	2.640	2.793	5.8
Sea	1.48	1.55	2.11	36.1
River	2.76	2.84	3.00	5.6
Motor	26.09	22.50	21.15	-6.0

Source: NK 75, p. 457.

Table 18

Profits and Profitability in Transport

	1965	1970	1975	1978	1979
Profit (million rubles)					
Rail	4,414	5,763	6,892	6,605	5,903
Sea	247	1,052	1,892	2,031	2,267
River	196	389	544	642	543
Motor	990	2,008	2,741	2,144	1,986
Profitability (percent of fixed and working capital)					
Rail	13.3	14.0	10.6	9.1	7.8
Sea	6.3	16.8	19.4	15.9	16.4
River	8.5	12.8	12.0	11.7	9.2
Motor	24.6	32.5	26.2	14.9	13.0

Source: NK 78, p. 519; NK 79, p. 539.

military hardware. Official Soviet price indexes for MBMW show monotonic decreases in price in recent years, as shown below.

Table 19

Official Wholesale Price Indexes for MBMW
(1970 = 100)

	1971	1972	1973	1974	1976	1977	1978	1979
Without Turnover Tax:	92	92	87	85	82	79	79	77
With Turnover Tax:	95	93	88	88	85	83	83	80

Sources: NK 75, pp. 231, 233, NK 77, pp. 142, 143; NK 78, pp. 138, 139; NK 79, pp. 164, 165. Indexed to 1970 based on data indexed to 1949.

This rosy picture is spoiled by the fact that Soviet price indexes give a false picture of price trends. The sample of products included in the index was fixed in 1961 and has not changed since that time. (M. Borstein, "Soviet Price Statistics," in V. Treml and J. Hardt, Soviet Economic Statistics, 1972, p. 359. See also Yu. Borozdin and T. Egert, Voprosy Ekonomiki, October 1976, pp. 82-83, and D.M. Palterovich, Park Proizvodstvennogo Oborudovaniya, 1970, pp. 186-189, for concise statements that the MB price index does not include new products.) By 1980, most of the 1961 products had ceased being produced. Those that are still in production do not, as a rule, rise in price, but prices either remain steady or fall as costs drop over time. This accounts for the drop in the official price index.

There is a great deal of evidence that, in contradiction to the official index, prices are rising rapidly in the MBMW sector. These rises occur when a new product enters the output mix of an industrial enterprise. The new product should, in Western price indexes, be reflected in the quantity sample at a price which accounts for changes in quality. If a product is 20 percent "better" than the product it replaces, the price should rise 20 percent on average, in the absence of inflation or deflation. The Soviets believe that such a result should also occur in their industry. In addressing the problems to be solved during the now-completed Tenth Five-Year Plan, one Soviet wrote that

> to a significant degree their solution depends on improvement of system of prices for machinebuilding output, which should provide a relative decrease in the cost of new equipment per unit of useful effect, and also contribute to achieving the maximum national economic benefit with a lower cost of machinery and equipment per unit of capacity productivity. (A. A. Gogoberidze, Planovoye Khozyaystvo, No. 9, September 1977, p. 72.)

There are numerous indications that the desired results are not coming about in Soviet machinebuilding. New products are often being priced in excess of their increased productivity. This effectively makes the new equipment more expensive than the old, reduces the productivity of the capital stock, and raises production cost and prices for the resulting products.

> A high price level, especially for equipment, leads to an increase in the cost of newly introduced fixed capital and to deterioration of the ... capital-output ratio. (A. Komin, Planovoye Khozyaystvo, No. 10, 1976, p. 8.)

This occurs in large part because the buyer of the overpriced equipment or other product has a clear incentive to make purchases which, in a market economy, he would never even consider.

> The point is that whereas the level of prices is of interest to the enterprise-supplier (as it affects the fulfillment of the marketing, profits, and profitability plans), frequently the purchaser displays no such interest. The enterprise may remain indifferent as to the price it pays for raw materials, semifinished products, and so on...Therefore, the prices are based on existing production costs and do not take into consideration the consumer quality of the goods, which is the most important factor. (V. L. Perlamutrov and L. V. Braginsky, Ekonomika I Organizatsiya Promyshlennogo Proizvodstva, No. 1, 1975, pp. 61-70.)

> ...in pursuit of larger profits, plant specialists will artificially overstate planned expenditures in their drafts of prices for new articles. (D. Nikitin, Sotsialisticheskaya Industriya, 24 November 1976, p. 2.)

> ...the buyer frequently "closes his eyes" to the high cost of components, since this cost will be completely included in the prices of finished products. And everyone knows that a higher price and a higher percentage of components make it easier to fulfill the plan for sales volume and commercial production output. (A. Komin, Khozyaystvo I Pravo, No. 3, March 1977, pp. 22-23.)

The designer and producer have similar incentives.

> ...the amount of the incentive markup is closely connected with the absolute amount of the standard profit, the price, and in the end the expenditures on the production of the new equipment. More expensive new products ensure the receipt of greater incentive markups (additional profit). As a result, scientific research institutes, design bureaus, and enterprises are interested, when developing new equipment, in using more expensive components, raw materials, and other materials. This ensures the approval of a higher wholesale price and correspondingly a higher incentive markup. (V. Shalimov, Voprosy Ekonomiki, August 1978, pp. 63-64.)

One of the manifestations of this increase in machinery prices is a rise in the output-capital ratio (fondootdacha) in machine-building compared to other branches of industry. The output-capital ratio is calculated as output in a year divided by the average annual value of fixed productive capital. This rising trend is the logical consequence of machinebuilding receiving increasing revenues compared to the value of its capital stock, while the remainder of industry must add higher-priced machinery to its capital stock without an equivalent opportunity to raise output prices. The table below provides data on the output-capital ratio for selected Soviet industries. (See V. K. Faltsman and V. N. Borisov, Ekonomika i Mathematicheskiye Metod, No. 2, March-April 1980; C. Budyanskiy, Izvestiya AN SSSR, No. 5, 1978; and B. Plyshevskiy, Voprosy Ekonomiki, No. 2, February 1981, for discussion of this calculation.)

Table 11

Trends in Output-Capital Ratios in Soviet Industry (Comparable Price Output/Fixed Productive Assets: 1970 Ratio = 100)

	1970	1975	1977	1979
All Industry	100	94.7	90.9	85.2
Electric Energy	100	99.3	98.7	95.5
Fuel Industry	100	93.0	87.3	77.8
Ferrous Metallurgy	100	89.5	84.0	77.8
Chemicals and Petrochemicals	100	104.4	103.8	92.4
MBMW	100	107.5	105.6	103.9
Forestry, Woodworking Paper	100	89.0	82.4	73.1
Construction Materials	100	92.2	85.3	77.4
Light Industry	100	86.2	81.8	76.9
Food Industry	100	90.9	83.8	78.5
Flour Milling	100	73.6	68.6	61.4

Source: Calculated from data in NK 79, pp. 140, 153.

According to one Soviet writer,

> The rise in prices of machinebuilding output does have an influence upon the indices of the branches consuming that output...The delivery of new equipment frequently serves as the main reason for the reduction in the return on capital and profits. On the other hand, in machinebuilding the basic economic indices (capital required, labor productivity, profitability) are extremely favorable due to the setting of unjustifiably high prices for new products. (V.P. Krasovskiy, Planirovaniye: Analiz Narodnokhozyaystvennoy Struktury Kapitalnikh Vlozheniy, 1970.)

The data indicate that MBMW is unique in Soviet industry. This uniqueness is largely attributable to the ability of factory managers to increase prices on new products beyond what the productivity of the machinery and equipment would justify.

Given that price increases on new products are the proximate cause of inflation in MBMW, the relevant questions are: how large is the output of new products compared to total output; how much overpriced are these new products; and, does this overpricing outweigh the gradual reductions of list prices on older products?

(a) New Products in Machinebuilding

While there are very detailed data on the share of new products in MBMW for certain time periods, precise breakouts by ministries over time are not generally available. There is also occasional ambiguity regarding whether the percentage shares of new products are given in terms of the total products list, the number of physical items actually produced, or the value of new products as a share of total value of output.

Data for the period up through 1970, given in what is believed to represent the percent of the total products list, are provided below.

Table 21

Percent of Machinebuilding Products List (in 1970)
Introduced in Various Time Periods

All finished items	100.0
Those introduced:	
Before 1960	15.8
In 1960-64	28.6 (Avg. 5.72)
In 1965-67	27.7 (Avg. 9.23)
In 1968-70	28.8 (Avg. 9.27)
Of which:	
In 1968	10.0
In 1969	9.9
In 1970	8.0

Source: Yu. Yakovets, Tseny v Planovom Khozyaystve, 1974, pp. 158-163.

The share of total machinery prices which were "temporary," and therefore high, in 1964 was 32 percent. (A. Komin, Ekonomicheskaya Reforma I Optovyye Tseny v Promyshlennosti, Finansy, 1968.)

An additional factor influencing MB prices in this period is the high share of MB output outside of series production entirely. This is composed of onetime and special order products, and it comprised nearly 50 percent of MB production in the early 1960s, and may comprise the same share of metallurgical equipment today. (Ya. Kvasha and V. Krasovskiy, Voprosy Ekonomiki, November 1964, pp. 8-16; V. Faltsman, Voprosy Ekonomiki, No. 8, August 1980.) Kvasha and Krasovskiy are not precisely clear on whether the 50 percent figure refers to value of output, share of the products list, or the physical units themselves, but the context suggests that the reference is to value of output. Kvasha and Krasovskiy state that, since these prices are inflated by 30-40 percent, the inflation for all equipment is 15-20 percent.

Data by MB ministry for the share of sales provided by products introduced during a six year period(presumably 1967-72) are given in table 22. The figures illustrate the rapid rate at which old products were replaced or reduced in significance in the value of output.

Table 22

Share of Sales Provided by Products Introduced in the Previous Six Years (1967-1972) (in percent of total sales)

All Machinebuilding	64.12
Electrotechnical Industry	58.0
Machine Tool Industry	50.68
Automotive Industry	72.1
Tractor and Agricultural Machinebuilding	62.97
Construction, Road and Municipal Machinebuilding	65.98
Machinebuilding for Light and Food Industry	86.39

Source: I. G. Filatov, Tekhnicheski Progress, Minsk, 1973.

Similar data for the 1967-1972 period are provided below.

> For example, when new prices for machinebuilding output took effect on 1 January 1973, it turned out that in comparison to the makeup of output included on the price lists that had taken effect on 1 July 1967, the products list had been updated by 45 percent, on the average, and by 60 percent to 80 percent in certain machinebuilding branches. (A. Koshuta and L. Rozenova, Voprosy Ekonomiki, No. 9, 1975, p. 65.)

The rate of product replacement may have accelerated in the Ministry of Construction, Road, and Municipal Machinebuilding during 1971-75. During this five year period, 84 percent of the product list in that ministry was updated, presumably obtaining temporary, high prices on the new output. (Stroitelniye I Dorozhniye Mashiniy, November 1979, pp. 2-5.)

The general trend in product replacement in MB has apparently not changed greatly during the 1970s, remaining at roughly 50 percent in each five-to-six year period. (Ekonomika I Matematicheskiy Metody, November-

December, 1978; A. Koshuta and L. Rozenova, Voprosy Ekonomiki, March 1977, pp. 18-20.) This average of roughly 10 percent per year is the same as that experienced during the 1960s, and higher than that for 1970.

In the machine tool industry, 80 percent of the products have approved list prices, with the remainder being sold at inflated prices. (A. Kostousov, Izvestiya, 14 March 1979, p. 3.) This may indicate an acceleration of new product introduction since the 1970 data for MB as a whole given earlier, but alternatively, the machine tool share may always have been higher than the average in MB.

In sum, the share of MB value of output provided by new products in series production appears to have remained fairly stable during the past decade at an average of roughly 10 percent per year. The share of non-series output has probably remained at roughly one-half.

(b) Overpricing of New Products

Complaints of overpricing on new products in Soviet economics literature are very common. They usually address the fact that the amount of price increase on new equipment is much higher than its increased productivity. A few samples are provided below.

> At the same time it is well known that a significant portion of the machine models developed in recent years are characterized by a sharp price increase as compared with previous models, and the increase of the prices considerably exceeds the increase of their productivity. (D. M. Palterovich, Seriya Ekonomicheskaya, July-August 1979.)

> The capacities of new machinery are increasing constantly, which is all well and good. But in many instances the prices of new equipment per unit of capacity are higher than the prices for the machinery they replace. (P. D. Podshivalenko, Voprosy Ekonomiki, March 1979.)

> At the same time, the prices for new machines are two to three times higher than the prices for similar old machines. And it turns out that their use in production instead of old machines worsens the economic indicators of the consuming enterprise. (V. G. Yankin, Finansy SSSR, August 1979.)

Examples of specific items the productivity of which is improved by less than the price increase are given below. There is clearly a wide variation in these figures. It is also clear that these are, for the most part, cited as extreme examples of negative aspects of pricing in the Soviet Union. The best aggregate indications of price rise derived from Soviet literature are provided in table 24.

(3) Price Reductions

The official MB price index includes no new products at all. The reductions in price shown by that index are thus applicable to a miniscule portion of actual MB production, presumably far less than 20 percent of the prices currently in effect, and an even smaller share of the value of output. This index can be discarded as a measure of price change in MB.

Comparable prices, used in calculating growth rates of output, also ignore the impact of new products by assigning their initial price as the base year "comparable" price. Prices only move down from that level, when they move at all, and the index of growth is upwardly biased as a result. By 1980, fewer than 20 percent of the MB list prices would be included in the 1970 comparable price base.

In addition, by 1980 the share of MB sales accounted for by new products (since 1970) should be well over 70 percent, if the data above also holds true for the 1970s as a whole. The comparable price index can then be disregarded in large part because the coverage is so small at present.

It is highly probable that the cost and price rises in MBMW have significantly outweighed the occasional price reductions that have occurred.

Table 23

Productivity and Price Change Data

Product	Productivity Increase (%)	Price Rise (%)
Construction Equipment (1965-75)	22	52
Machine Tool Equipment (averagefor recent years)	1	14-15
1A36 Machine Tool	15	300
PPM-4M Rock Loader	7	110
EGK-8 Excavator	80	160
T-150 and T-150K Tractors	100	140-180
Kolkhoz Trucks (1965-76)	47	95
BelAZ 549 Dump Truck	87.5	Over 400
Computer Operated Machine Tools	40-60	900
Plowing Machine	20	55
Sowing Machine	35	210
Turbine	267	530

Sources: V. Selyunin, Sotsialisticheskaya Industriya, 31 July 1975, p. 2, cited in Oxford Bulletin of Economics and Statistics, February 1978, p. 68; A. Koshuta and L. Rozenova, Voprosy Ekonomiki, March 1977, pp. 23-24; M.G. Nazarov, Productivity of Labor, Ekonomika, 1977, p. 37; V.P. Dyachenko, Problems of Planned Price Formation, Nauka, 1974; V.G. Lebedev, Effectiveness of Socialist Production, Mysl, 1979, p. 255; Planovoye Khozyaystvo, translated in Current Digest of the Soviet Press, Volume XXXI, No. 13, p.11; N. Glushkov, Kommunist, 22 May 1980, p. 46; L.S. Glyazer, Ekonomika I Organizatsiya Promyshlennogo Proizvodstva, November 1979, pp. 21-33; V. Alferyev, Materialno-Teknicheskoye Snabzheniye, No. 10, 1978, pp. 40-46; A. Komin, Planovoye Khozyaystvo, No. 10, 1976, pp. 7-15.

Table [illegible]4

Broad Sectoral Inflation Rates
(average annual percentage)

Ship Construction (1971-75)	4-5
Metal cutting machine tools	
1968-72	[illegible]
Early 1970s (adjusted for productivity)	[illegible].0 [illegible].2
Construction Equipment (1965-74)	4.2
Seven sectors of MB 1970-76	3.3
Construction Machinery 1971-75 (adjusted for productivity)	10.7 [illegible].7

Sources: V. Levitin, Vodnyy Transport, [illegible] May 1976; A. A. Koshuta, Kachestvo I Tseny, 1976; M. G. Nazarov, Productivity of Labor, 1977; Selyunin, Sotsialisticheskaya Industriya, July 31, 1975; N. Mitrofanova, Voprosy Ekonomiki, August 1978; T. Bakayeva, Vestnik Statistiki, March 1977.

(5) Approximate Inflation Rates

Cost and price increases are clearly occurring throughout the Soviet economy. Rough estimates of the rate of cost/price increase during the 1970s for the four sectors touched upon above follow:

Agriculture: 3-5 percent annually;

Extractive industry: 2-4 percent annually;

Transportation: 7-10 percent annually;

Machinebuilding: Minimum of 2-4 percent annually, adjusted for productivity.

It is likely that such inflationary pressures also apply to the military sector.

> Expenditures for the production of new military equipment and weapons have a more marked tendency to increase than do the expenditures for the production of new civilian products. This is due to the following factors; first, the use of critical, costly raw material, advanced expensive equipment, and a large amount of increasingly expensive electric energy and electronic equipment; second, the high relative share of expenditures for scientific research and experimental design work, which entails the hiring of a large number of skilled workers and the onetime production of the equipment necessary for these projects; third, the production of military products in small series in peacetime; and fourth, the necessity of putting out the needed type of product in a very short period. (P. V. Sokolov, Political Economy, Voyenizdat, 1974. Emphasis in original.)

It should be noted that the detailed regulations on pricing do not apply to "defense output." (Ekonomicheskaya Gazeta, December 1976, p. 16.) This may account, in part, for the "more marked tendency" of military procurement prices to increase.

i. Soviet Energy Trends

The outlook for Soviet energy, from the perspective of the USSR's leadership, is highly favorable. Prospects for the full satisfaction of domestic needs, planned energy exports to East European Communist countries, and negotiated quantities for customers in Western Europe appear to meet Soviet expectations through the 1980s and beyond. In addition to providing solid economic benefits for the USSR, Soviet energy self-sufficiency is also likely to result in greater political influence by the Soviet Union over certain decisions of its West European customers and, perhaps to a lesser extent, of Japan.

This overall positive energy outlook for the USSR is reflected by the following conclusions:

- Development of Soviet natural gas, from the world's largest proved reserves, will continue at a high rate; production is expected to increase at a rate of 7-9 percent and export growth will reach more than 15 percent annually.

- Development of Soviet oil, from the world's second largest proved reserves, will be maintained at a clearly defined pace; the USSR maintained its position as the world's leading producer of oil, with production in 1980 of slightly over 12 million barrels per day. It will reach its 1981 production goal of approximately 12.2 million barrels per day, followed by a gradual decline in the production growth rate through the mid and late 1980s. The USSR has the potential to increase production in the 1990s depending on whether it is in its interest to increase exports at that time.

- Continuation of the USSR as a net oil exporter for the foreseeable future is anticipated.

- Continuing increases in the rate of hard currency earnings, resulting from rising world oil prices, will expand opportunities for acquiring Western energy technology.

- The USSR is likely to achieve a production upswing in coal, from the world's largest proved reserves, by the late 1980s despite a recent production decline.

- The USSR will increase its secondary refining capability, making possible a greater output of light products from fuel oil. Domestic fuel oil requirements will decline because of increased use of natural gas.

- The USSR will pay continuing close attention to alternate energy sources. However, these alternatives are not expected to make a significant contribution to Soviet energy output before the end of the century.

- The Soviet Union will seek to achieve limited conservation targets, although substantial savings appear feasible through the substitution of other fuels for oil.

(1) Energy Planning

Soviet planners clearly understand the politics and economics of oil. This knowledge is and will be used to meet their hard currency requirements, place pressure on world supplies and prices, and through oil exports, seek to influence political decisions of other states. It would be a mistake to assume that the Soviets will dramatically increase oil production, thus easing supply problems and stabilizing or reducing prices. This is not in their interest. Neither should it be expected that the Soviets would acknowledge a significant oil discovery such as the extremely large find reported in West Siberia in December 1980. This, again, is not in their interest.

It is unlikely that the political leadership lacks a comprehension of existing deficiencies. These have been acknowledged publicly by such authoritative officials as President Brezhnev, former Premier Kosygin, and his successor, Tikhonov. Instead, it is probable that the political leadership continues to confront Soviet energy needs in a fashion that offers courses of action feasible within their framework of political and bureaucratic imperatives.

The energy planning function is probably performed by the special committee of the Council of Ministers which sets energy policy for the USSR and is capable of fitting these policies into the general overall plans for the economy. Since all of the ministers of the organizations involved in the various aspects of the fuels industry are represented on this committee, a concerted effort in support of the necessary programs is possible.

More directly involved in the actual development and production of oil is the State Committee on Reserves (GZK), which appears to have a degree of approval authority for the allocation of money and resources to oilfield development. The proof of reserves presented to the GZK by the geologists must be verified by a committee of the GZK. Thus, if evidence indicates the beginning of field development, pipeline construction, refinery expansion, or the construction of power systems into uninhabited areas reported as having good hydrocarbon potential, the most reasonable judgment is that the projects have been approved by the GZK and this approval has been based on detailed examination of the reserves.

(2) Energy Projection: 1985

The accompanying table indicates Soviet energy production and consumption from 1970 projected to 1985. The latter figures take the lower end of the Soviet forecasts for this period but are within the range of previous DIA projections of exportable oil amounting to 141 million mt (80 million to East Europe, 61 million to the Free World). If the higher end of the forecasts are considered, the exportable oil surplus to the West increases to 82 million mt. Natural gas exports should increase from 50 billion cubic meters (m3) in 1980 to 100 billion m3 in 1986-87. About 60 percent of the exported gas is destined for Western Europe, including 20 billion m3 from existing contracts and 40 billion m3 from the Yamburg project. In 1985 this would furnish the USSR with a total revenue from gas of $11.2 billion. Combined with $11.4 billion from the sale of oil, the hard currency earnings from these resources would total over $22 billion.

(3) Substitutability

There is little doubt that the USSR will be able to substitute natural gas for oil in many areas of consumption. Substitution is viewed as one of the most viable means of conserving oil. Nikolai Ryzhkov, First Deputy Chairman of the USSR State Planning Agency (Gosplan), stated that the USSR had opted to "extract more gas and reduce the rate of oil production growth compared with the previous (Tenth) Five-Year Plan." He added: "Oil is irreplaceable; so we decided to save it for future generations." Natural gas production is scheduled to jump 43-47 percent to 620-640 billion m3 per year by 1985, while crude oil production will grow only 3 percent during that period.

Table 25

Soviet Energy Production and Consumption, 1970-85 *

	1970		1975		1980		1985**	
	Production	Consumption	Production	Consumption	Production	Consumption	Production	Consumption
Coal	624.1	557.5	701.3	594.2	716.0	710.3	773.0	717.2
Oil	353.0	279.2	490.8	375.1	603.0	441.0	624.0	475.0
Natural Gas	197.9	182.7	290.4	276.4	435.0	380.1	630.0	552.0
Peat	57.9	51.7	52.0	46.8	76.9	75.4	93.0	42.3
Oil Shale	27.1	24.3	36.0	34.1	52.3	50.8	62.0	61.5
Firewood	106.8	94.4	95.6	85.9	92.8	92.8	81.0	80.3
Hydroelectric	124.4	105.7	126.0	107.0	185.0	157.3	230.0	197.4
Nuclear	3.7	3.1	20.2	17.2	71.9	61.0	220.0	189.5

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* In millions of tons, billions of m^3, and billions of kWh.
** Estimated.

Domestically, the USSR has started the shift from a coal-oil energy base to one in which natural gas and nuclear power will play an ever-increasing role in the energy mix. Coal and oil, which combined constituted 72 percent of primary energy fuels consumed in 1970, will represent 56 percent in 1985. Natural gas and nuclear power, which supplied almost 20 percent of the primary energy consumed in 1970, will grow to 38 percent by 1985. This trend is expected to continue into the latter part of the century, reaching 40 percent in 1990 and between 42 and 44 percent in 2000.

(4) Natural Gas

Natural gas has been the most dynamic of all the Soviet Union's energy resources. By the end of the Tenth Five-Year Plan (1976-80), natural gas was the only fuel that not only met its production target but surpassed it. This rapid growth is continuing at the rate of 7-9 percent annually, and there is little doubt that the USSR's natural gas production will soon exceed the rest of the world's production. Already the world leader in the export of natural gas, the Soviets are expected to widen this lead by a spectacular margin during the 1980s.

The Soviet natural gas industry entered the 1980s with more than 40 percent of the world's proved gas reserves. These reserves are estimated at over 30 trillion m3, roughly equivalent to over 180 billion barrels of oil. Furthermore, this reserve base will continue to increase as additional gasfields are discovered (more than 120 fields have been discovered in the past 3-year period, 1977-79). It is estimated that Soviet gas reserves will total 43.5 trillion m3 by the year 2000 and support a production level of over 1.5 trillion m3 a year.This huge resource is seen by Soviet planners as a means to help reduce domestic requirements for petroleum. This, in turn, could permit greater exports of oil, a major source of hard-currency earnings. More important, natural gas is being viewed as a key export resource that soon could generate even greater hard-currency earnings than oil. Although these gas reserves are located far from the centers of population and industry, the construction of thousands of miles of 1,220-mm and 1,420-mm (48- and 56-inch, respectively) pipelines has effectively unlocked this massive resource base.

Pipelines are the only means of economically transporting large volumes of natural gas. In the Soviet Union the gas pipeline network has grown very rapidly, from only 5,000 km in 1965 to nearly 125,000 km by the end of 1980. Although it is only about one-fourth the size of the United States' system, the Soviet gas pipeline network represents a major construction achievement. Much of the system is constructed in areas of geographical adversity, including the deserts of Soviet Central Asia and the tundra marshes of West Siberia, where transportation and support bases are almost nonexistent. Nevertheless, the USSR has already achieved significant goals in the exploitation of West Siberian natural gas and is now the world's leader in the export of this primary energy resource.

The Soviet Union's massive reserves of gas represent the cornerstone of a long-term energy policy that has far-reaching implications, both domestically and internationally. Within the USSR itself, natural gas is expected to play a major role in meeting Soviet energy needs during the late 1980s and early 1990s. It is during this period that the necessary infrastructure to exploit West Siberian oil and gas will be at the height of its development.

Consequently, heavy reliance will be placed on natural gas to satisfy the demands of the electric power and industrial sectors. Internationally, these natural gas resources will enable the USSR to continue providing the states of Eastern Europe with 70-80 percent of their hydrocarbon requirements.

Prospects are good for the development of West Siberian natural gas as a result of Western credit and technical assistance in the largest East-West joint venture to date. This planned Yamburg natural gas pipeline, slated principally for export to Western Europe to earn hard currency for the Soviet economy, will deliver $8 to $10 billion worth of gas, with deliveries beginning in the mid-to-late 1980s to West Germany, France, Austria, Italy, Belgium, and the Netherlands.

The Yamburg line, which is still under discussion, is currently planned to carry 40 billion m3 of natural gas annually from West Siberia to Western Europe, and an additional 10 million m3 to Eastern Europe. In current negotiations, the USSR and West European countries are bargaining for the most favorable terms; the most likely arrangements appear to be an amortization period of 8-10 years with an interest rate of 7-7.5 percent. The USSR has requested loan repayment to begin after completion of the line, an issue that is under discussion.

The Yamburg natural gas price is to reflect the cost of the regional oil it replaces, which indicates a price of $5.41 per 1,000 ft3 or $189.35 per 1,000 m3. When the pipeline system begins operating at design capacity, revenues from Western Europe should approximate $7.6 billion annually. If the line isamortized in 8 years, about $2 billion would be required for interest and principal reduction, leaving $5 billion in hard-currency earnings. This could be used for additional imports from the West. It could also reduce the amount of oil to be exported by 15 million additional mt. A surge in energy prices above the estimated 28-percent increase would provide an additional bonus for the USSR.

The Yamburg line is not, however, the only gas trunk line planned in the Eleventh Five Year Plan, since the volume of materiel being ordered (pipe and equipment) indicated that four new lines are envisioned. The Sovet energy projections in December 1980 further supported this estimate by presenting gas extraction figures of the Soviet Union for 1985 of 620-640 billion m3. The increase over the [illegible] goal is 173-201 billion m3, a volume which would require at least six lines. Four of these lines should supply much of the growth in domestic requirements. Very recent data indicated that six-to-seven lines are contemplated in the Eleventh Five Year Plan instead of four. This probably includes two lines already under construction.

(5) Petroleum

The examination of the Soviet petroleum sector indicates an existing or planned program to continue the growth of this vital industry. There are, to be sure, problems of organization, manpower, and equipment. These, however, are not unusual within the Soviet Union and probably will have little effect on the industry. Production is expected to rise slowly through 1985, level off during the late 1980s, and then increase after 1990. The increase will, of course, be strongly influenced by Soviet perceptions of the world economic and political situation and what would ultimately be in their best interest.

The Soviet petroleum industry is well organized, tightly structured and closely monitored. The industry's basic technological and operational procedures do not differ markedly from those used in the West. Exploration, discovery, drilling, production, transportation, and processing are normal steps in a complex procedure which, in the case of the Soviet Union, is a military secret.

Oil production during the Eleventh Five Year Plan is scheduled to increase from its 1980 level of 12.06 million b/d to between 12.4 and 12.9 million b/d by 1985; West Siberia will continue to increase its output and is scheduled for a production rate of 7.7 to 7.9 million b/d. This rise is in consonance with the trunk pipeline expansion from West Siberia and follows the previously established patterns. A new trunk line is being placed under construction, and as it is completed, oil production will rise to meet the capacity. This pattern has occurred five times during the development of West Siberian fields.

Table 26

West Siberian Trunk Pipeline System

Pipe Diameter (mm)	Year Completed	Capacity	Aggregated Capacity	Regional Production Capacity	Year
		(thousands of b/d)			
1,020	1967	840-1,000	840-1,000	896	1971
1,220	1972	1,400-1,560	2,240-2,560	1,254	1972
1,220	1973	1,400-1,560	3,640-4,120	1,774	1973
1,220	1976	1,400-1,560	5,040-5,680	5,700	1979
1,220	UC 1980/81	1,400-1,560	6,440-7,240	6,060	1980
				7,700-7,900	1985 est

However, in an article in Pravda (13 February 1981) F. Salmanov, Chief of Glavtyumengeologiya (Tyumen Ministry of Geology), called for revision to the CPSU Central Committee draft from the 26th CPSU Congress to include a statement "to increase the extraction of oil, including gas condensate, to 450-500 million mt (9-10 million b/d) and gas to 1 trillion m3 by 1990 in West Siberia." This is an increase of approximately 1.2 million b/d of oil and 630-670 billion m3 of gas over the 1985 goal.

(a) West Siberia

West Siberia, consisting of the oil and gas producing oblasts of Tyumen and Tomsk, will remain the major producer of Soviet oil for the next 10 to 15 years. Geographically, this region is one of the largest plains in the world. It covers an area of about 3.2 million km2, consisting of 2.8 million km2 of land, including lakes and rivers, and 0.4 million km2 of water surface. The region stretches from the Ural Mountains in the west to the Yenisey River in the east, from the Kara Sea in the north to Kazakhstan and the Altay Plateau in the south. By comparison, the entire lower 48 contiguous states of the US amounts to about 7.8 million km2. The lowland is poorly drained and very swampy, especially in the central portion. The swampy region amounts to about 57 percent of the territory, while the area covered by lakes is about 10 percent. For this reason the construction of railroads and highways is complicated and involves the crossing of broad river flood plains and the construction of bridges, dikes, and drainage systems. At the present time the main petroleum-producing regions are in the central portion of the lowland--in the swampy and taiga (coniferous) zone of Tyumen Oblast.

(b) Equipment and Technology

The Soviet Union probably produces 90-95 percent of its basic oil production equipment, including drilling rigs, bits, down-hole motors, drill pipe, well casing, gas oil separators, valves, compressors, lifting pumps, and pumping stations. It does not produce a number of high-technology items such as sophisticated computers for production control or digital processing of seismic data, and this undoubtedly affects the Soviet oil industry. In addition, the USSR does not produce equipment for oil production under unusual conditions. When these unique situations arise, an assessment is made of the frequency of need and the comparative cost of foreign purchases versus the cost of establishing a production factory. If the external purchases are more advantageous, the decision is quickly made to utilize these sources.

The USSR has little experience in offshore operations and has relied on foreign sources for equipment and expertise. Development in this environment should continue through the 1980s with West European assistance.

Although the USSR manufactures some 48-inch diameter pipe for oil trunk pipelines, it purchases most of its needs from foreign suppliers. A shutoff of large-diameter pipe deliveries to the Soviets would have a severe impact on the expansion of their oil production for several years while they retool facilities to produce the necessary pipe diameters. The midterm results would be a stabilization of production until the pipe manufacturing plants were completed. It would only delay, not stop, a rise in Soviet production capability. In the long run it would impact on the present suppliers of pipe in Western Europe and Japan, affecting their steel industries and their economies as well.

(6) Drilling Requirements and Capabilities

Table 27 indicates the exploratory drilling conducted by each ministry. It is evident that until 1973 the exploratory drilling for gas was a joint effort by the Minstry of Petroleum Industry, (MPI) and Ministry of

Geology. In 1973 the Ministry of Gas assumed responsibility for drilling gas development wells and part of the exploratory wells. The average depth for production wells in the USSR in 1978 was 1,994 meters, for exploratory wells 2,797 m. Comparable data for the US for all wells was 1,484 m and for exploratory wells 1,822 m.

Table 27

Exploratory Drilling by Ministry

Territory & Ministry	Seventh FYP 1961-65			Eighth FYP 1966-70			Ninth FYP 1971-75			1976
	Total	Oil	Gas	Total	Oil	Gas	Total	Oil	Gas	Total
	in thousands of meters									
USSR	24,661	16,504	3,157	26,226	16,189	10,037	26,123	17,762	836	
Min of Oil	16,342	11,339	4,403	15,380	11,200	4,180	14,532	12,176	2,356	11,960
Min of Geology	8,263	4,565	3,718	10,711	4,989	5,722	10,715	5,502	5,213	2,075
Min of Gas	36	-	36	135	-	135	876	84	792	1,106
European USSR	18,699	12,544	6,155	17,889	11,741	6,148	17,656	12,362	5,294	
Including										
Min of Oil	14,503	10,225	3,828	12,468	9,324	3,144	11,868	9,937	1,931	
Min of Geology	4,648	2,319	2,327	5,421	2,417	3,004	5,218	2,362	2,856	
Min of Gas	-	-	-	-	-	-	570	64	506	
Asian USSR	5,962	3,960	2,002	8,337	4,448	3,889	8,466	5,400	3,066	
Including										
Min of Oil	2,288	1,714	574	2,912	1,876	1,036	2,663	2,238	425	
Min of Geology	3,637	2,426	1,391	5,290	2,572	2,718	5,497	3,140	2,357	
Min of Gas	37	-	37	135	-	135	306	22	284	

In 1979 exploratory drilling by the MPI, which was concentrated in the older areas of European Russia, totaled 2.1 million meters o exploratory and appraisal drilling. Areas of drilling included the Georgia-West Azerbaijan area of the Transcaucasus, the edge of the North Caspian Basin, and West Turkmen near the Iranian border. In the Volga-Urals Basin good results were obtained in Bashkiria where small prolific reef features were found, and in Udmurt where other structural reef features await drilling. Some geologists also expect good results from deep structures in the North Caucasus.

In West Siberia exploratory drilling is primarily the responsibility of the Tyumen Exploratory Association (TEA) and the Ministry of Geology. During 1978 the TEA had 56 drilling rigs in this area while the Ministry of Geology had about 75 rigs. The number of rigs of the Ministry of Geology may be higher since about one-third of the total Ministry of Geology drilling is in Siberia. Exploratory drilling for oil in West Siberia amounted to 690,000 m in 1979 and an estimated 800,000 m in 1980. The 1980 estimate could be exceeded since plans indicate that the number of drilling brigades assigned to the TEA could reach 100 in 1980. The Ministry of Geology also conducts exploratory drilling for oil and gas throughout the remainder of the USSR and drilled about 2.5 million m in 1979. In West Siberia, a considerable amount of the appraisal drilling will be in and near the Middle Ob River where new targets include small structural closures within troughs, nonstructural traps, and the deeper Jurassic of Northern Tyumen and the Gydansk Peninsula where many geologists believe there could be rich oil pools beneath the gas pools. In the past few years several of the gas pools in the north have been found to contain oil under the gas. High pressure oil has been found at Salym near the middle Ob River but the well yields are moderate and erratic and the Soviets detonated a nuclear device in this field, perhaps for reservoir stimulation. Similar high pressure oil has been found around some gas fields in northern Tyumen. Exploratory drilling is also increasing in Eastern Siberia and Yakutia. The Soviets indicate that a total of 890 wells have been drilled in this 13 million sq mi sedimentary area, one well per 14,000 sq mi. Most discoveries in this area to date have been gas or condensate but the stratigraphy, tectonics and maturation may occur at deeper depths in the Triassic and upper Paleozoic. The drilling by the MPI in the older producing areas have been successful in some degree in slowing the decline rate. Production in these regions peaked in 1974, began to drop in 1975, and despite holding level in 1976, has declined steadily. By 1980 the daily production in these regions had fallen more than a million barrels per day (b/d). The slow decline is expected to result in an additional drop of 500,000 b/d by 1985. This fall in production apparently results from failure to find sufficient reserves to compensate for the ongoing production. In 1979, however, this situation had improved and one open source reported that Soviet reserves outside of West Siberia had stabilized. The finding rate was calculated at 97 mt per running m. There are definite advantages to continued exploratory drilling in the areas outside of West Siberia because of the availability of the transportation system, electric power and labor supply. Prior to 1979 the MPI criteria for producing a field was 30 million mt (210 million barrels) of proven reserves but smaller fields were accepted if there was an adequate infrastructure.

Exploratory drilling, in fact all drilling, is shifting to West Siberia and the planned and estimated achievable goals for this region in the Eleventh Five Year Plan are expected to be 2.5 to over 3 times the rate reported drilled there by the Soviets in the entire Tenth Five Year Plan; this is shown below.

Table 28

Exploratory Drilling by Productive Region

	Seventh FYP 1961-1965	Eighth FYP 1966-1970	Ninth FYP 1971-1975	Tenth FYP 1976-1980	Eleventh FYP 1981-1985
West Siberia	1,628	3,061	3,105	3,861	Plan 12,500/ Est 9,000
RSFSR	14,988	13,388	13,367	12,639	n/a
Other	8,045	9,777	9,551	9,500(est)	n/a
Total	24,661	26,226	26,123	26,000(est)	n/a

The drilling of production oil wells is the responsibility of the Ministry of Petroleum Industry. Examination of the Soviet drilling statistics indicates a significant increase in development drilling beginning after 1970 and increasing rapidly until 1980. This has been accomplished primarily through reorganization, improved equipment and greater efficiency. Essentially, the Soviet drilling rig inventory was replaced in the period between 1970 and 1978, a trend that is continuing as new models become available. Although the actual number of drilling rigs was reduced during the Ninth and Tenth Five Year Plans, the number of rigs is expected to expand as additional drilling organizations are formed.

The actual increase in the number of drilling brigades has been relatively small; in 1978 there were 1,215 drilling brigades in the Ministry of Petroleum. These were expanded to 1,246 in 1979 and 1,288 in July of 1980, about a 6 percent increase in 2 years. In the same period drilling by the MPI increased about 18 percent.

Development drilling has undergone the most significant growth in West Siberia, increasing from 2.8 million m in 1975 to a goal of 9.7 million m in 1980. In 1975 West Siberian development drilling represented 30 percent of the country total and in 1980, 54 percent of the total. Since West Siberia will play an increasing role in Soviet oil production over the next 10 to 15 years there will be a need for additional development drilling to increase production from this area to compensate for declining production in older areas. Lalyants, the Deputy Chairman of Gosplan, has indicated that the development drilling required in West Siberia during the Eleventh Five Year Plan will amount to 75.6 million m. This is an increase of 26.9 million m over the Tenth Five Year Plan. Since the 1980 annual drilling rate was about 9.7 million m, current capacity is at least 48.5 million m, so the planned increase seems fairly reasonable.

In January 1981, the Soviets released data on the number of production wells planned throughout the Soviet Union and in West Siberia. The figures given, when factored for the number of injection and observation wells, support Lalyants figures for development drilling requirements.

Table 29

USSR, Production Wells

	1 Janaury 1981			1 January 1986			
	Producing	Injection Observation	Total	Producing	Injection Observation	Total	1981/86 Difference
West Siberia	12,156	4,271	16,427	35,886	12,608	48,494	32,057
Other, USSR	70,312	24,707	95,028	86,559	30,392	116,951	21,983
Total	82,477	28,978	111,455	122,445	43,000	165,445	53,990

These figures indicate that West Siberia's share of the national total will increase from a total of 14.7 percent of the producing wells in 1981 to 29.3 percent in 1986. The development drilling effort in West Siberia will represent about 59 percent of the total drilling programmed for the USSR. The drilling of West Siberian wells is to occur in fields where the necessary reservoir development has taken place so the well yields and total number of wells required to meet the 1985 goal are known. Athough West Siberian development drilling calls for 75.6 million m in 1981-85, development drilling in the remainder of the USSR should total another 60 million m for a national total of 135 million m. This is annually about 10 million m greater than that achieved in 1979 but probably attainable if the necessary priorities are assigned to the effort.

Table 30

Drilling Brigades in West Siberia

Year	Brigades	Apparent Annual Drilling Rate Per Brigade (in meters)
1977	79	48,000
1978	100	49,500
1979	133	52,900
1980	155	62,000

The annual drilling capacity of the 155 brigades was estimated at about 9 million m in 1980. Assuming a 5 percent annual improvement in efficiency the total amount of drilling from these brigades for the Eleventh Five Year Plan would total over 52 million m. Thus to make up the difference between this figure and that projected from Lalyant's figures would require an average of 83 additional drilling brigades through the Eleventh Five Year Plan. These would probably be added in increasing numbers over the Five Year Plan. Increased efficiency would probably reduce the number of new brigades required, but in summary the additional brigades required probably does not represent any difficulty for the Soviets.

The Soviets have demonstrated their ability to increase both the number of drilling organizations and improve the efficiency of operations. In July 1980, N.A. Mal'tsev, Minister of Petroleum, stated there were two fundamental ways to increase the volume of drilling. The first is to increase the number of drilling crews and drilling rigs. The second is to increase drilling through the most effective use of equipment and the technological improvement of equipment. As with the exploratory wells, additional development drilling must be preceded by the development of the necessary infrastructure to support the operations.

In 1976, it was estimated that in West Siberia 3,500 mt of materiel were required to drill a 2,300 m producing well. This figure would indicate that 1981-86 materials to support development drilling could reach 115 million mt. If, however, the original estimate included the necessary materials for the transportation infrastructure, then the 1981-85 figures would not be as great because the infrastructure requirements are probably declining as the capacity of the transportation network is expanded. Obviously West Siberia is receiving priority delivery on new equipment, technology, manpower, and money. This is apparent from the number of wells being drilled. In 1979, 17 million m were scheduled throughout the USSR to add 6,247 wells (well depth calculated at 2,721 m). In West Siberia 6.061 million m were scheduled, at 2,512 m equals 2,413 wells. West Siberian wells are not as deep as the national average. The 2,413 wells drilled in 1979 by the 133 drilling brigades equal 18.1 wells per brigade, which is over 3 times the national average.

The Soviets apparently place great store in improving the productive time of the drilling organizations and table 32 reflects the drilling range of the brigades in West Siberia during 1979. The 1980-85 period should also show an improvement in Soviet equipment, structural changes in operational modes, improvement in and the formation of additional drilling brigades. Ths should occur primarily in West Siberia, although Komi, Udmurt, Kazakhstan, Groznyy and the Caspian areas should also have increased drilling goals.

Table 31

West Siberian Drilling; 1979

Drilling per Brigade (in thousands of meters/year)	Up to 20	20-30	30-40	40-50	50-60	60-70	Over 70	Total Brigades
Number of West Siberian Brigades	10	14	25	29	19	4	9	109
Number of Watch Brigades*	9	15	10	9	3	0	0	46
Total	19	29	35	38	22	4	9	155

*Expeditionary Units

Considerable discussion has resulted from a statement by V. Filanovsky, a Gosplan official, who wrote that increased drilling was required because of a declining well yield. Filanovsky referenced a 1980 planned yield per new well of 71.1 mt. This was further developed by I. Korostelev, a Surgut engineer, who stated the average yield per new well in West Siberia in the Tenth Five Year Plan was 93 mt per day and in the Eleventh would drop to 38 mt. This accounts for the large number of wells which are planned to be drilled during the Eleventh Plan. The well yield however, is applicable to the field where the necessary drilling has been accomplished to establish reservoir properties and excludes many fields which have been discovered but not tested, either because they are not in the present development plan or are inaccessible. Standard Soviet development plans for West Siberia, probably on a regional basis, i.e., Middle Ob, calls for the development of large fields, followed by middle-sized fields and then by the small fields. Within each category priority is given to fields with high-yield wells over 80 mt a day followed by those with wells averaging 40-80 mt and finally those with less than 40 mt. Thus a large field with a lower well yield requires more wells to produce at a higher rate or would produce at a lower rate for a longer period. Table 33 shows the average well yield based on the number of wells and the known or stated production goals. The 1985 yield was calculated by dividing the total number of wells into the planned production. This indicates how far-reaching the Soviet production plans are, their knowledge of the resource base, and what is required to attain their goals.

Table 32

Producing Wells and Production, West Siberia

Date	Number of Producing Wells	Average Oil Production (mt)	Oil Production (million mt)
1970	1,200	71.6	31.5
1975	4,100	98.8	148
1978	8,000	86.9	254
1980	12,475	66.5	303
1985	35,886	29.4 - 30	385-395

(7) Reserves

Quantitive estimates of reserves vary considerably, ranging from a low by World Oil of 60 billion barrels to the extremely high estimates of

150 billion barrels by Petrostudies. The accompanying table indicates some of these. These figures include those reserves considered economically recoverable and accessible at the time the estimates were made.

Table 33

Proved Oil Reserves, Estimates
(Billion of Barrels)

World Oil 1980	60
BP Statistical Survey 1979	67
Petroleum Encyclopedia 1980	67
PETROLE Informations Dec 1980 (French)	66
Petroleum Economist 1980 (UK)	66
DIA 1980	80-85
Petrostudies 1979	150
European Petroleum Yearbook 1979	95

DIA believes the reserves that are accessible, producible oil are between 80-85 billion barrels. The increase over the 1977 DIA estimate of 75 billion barrels reflects the major increase in world oil prices between mid-1979 and mid-1980, which has now made previously uneconomical deposits worth developing.

DIA estimates that West Siberia currently has reserves of 40-45 billion barrels and the areas outside West Siberia have roughly the same amount. Much of the West Siberian reserves are contained in Samotlor, which is the largest producing field in the USSR. DIA estimates that Samotlor's accessible reserves represent 22-28 percent of the USSR's total and, on 1 January 1981 it amounted to 16-20 billion barrels. This estimate is calculated on the basis of the Soviet book Ekonomicheskiye Problemy Razvitiya Neftyanoy Promyshlennosti Zapadnoy Sibiri, (I.D. Karyagin, Moscow, 1975.) In the discussion of petroleum development the author presents a table in which he listed the development data on the first fields of West Siberia. Data included the year development began, year of maximum production, and period of stable production.

In the areas outside West Siberia, reserves recoverable with existing technology are expected to drop but still be adequate to support the non-West Siberian production of 4.7-5 million b/d. Although heavy oils are not considered viable reserves at this time, they probably should be included in the reserve estimates in about 1990, when the Soviets apparently expect significant production from these reserves, probably in the range of many hundreds of thousands of barrels of oil per day.

DIA believes that the Soviet reserve discovery and development programs are designed to meet short- and long-term goals and these programs are planned in detail. Short-term reserves are those where the extent of the field and where the reservoir properties are known. These short-term reserves are designed to meet requirements over the next 10 years and to permit detailed planning and resource allocation for achieving goals. Long-term reserves, those which exceed 10 years, have also been discovered, but have not been examined or tested to indicate actual production levels. The boundaries within the reserve classifications are fluid and will shift to reflect production, increased testing, or wildcatting.

Finally, consideration must be given to the developments based upon increasing oil prices. In 1978, a Soviet article discussed the minimum requirements for economic development of oilfields in West Siberia. At that time it was not cost effective to produce a field with reserves less than 10 million tons (73 million barrels) and yields of wells less that 10 million tons could be economically worked at depths to 2,950 m. With an increase of field reserves, and particularly well yield, the economic indicators improve. With yields of more than 20 tons per day, almost all small fields can be brought into production where producing reservoirs are no lower than 3,500 m. At the 1978 oil price of $12.80 a barrel, oil pools at depths below 4,500 m could be economically produced if well yields were not less that 50 tons (350 barrels) a day. The 1981 price is $38.00 a barrel. What effect this has had on the reserve base is not known at this time but it should be a key consideration. It is necessary to keep in mind the long-term economic perspectives concerning energy development. The economics of fuel reserves requires a constant revision from the point of view of their marginal expenditures and the prices on the world market. For example, the increase of oil prices on the world market during the 1973-75 period economically justified quick growth of oil reserves that were possible for extraction: from about 675 billion barrels to nearly 2,330 billion barrels in the Free World. The projections of Soviet oil reserves should therefore be adjusted to reflect continuing price changes.

(8) Exports

As customers for Soviet oil and natural gas on the one hand and suppliers of credit and energy on the other, Western Europe and, perhaps to a lesser extent, Japan have become important indirect participants in the USSR's energy industry. The USSR might well be inclined to accommodate an increasing proportion of these nations' energy needs if the occasion should arise, as France, Italy, the Federal Republic of Germany, and Japan play a key role in Soviet plans for energy development and expansion of their remotely situated hydrocarbon resources.

Soviet data indicate that USSR oil deliveries, offered well below current world prices, account for 80 percent of petroleum consumed by other CEMA members, and for about 25 percent of their total energy use. Soviet gas and electricity exports to CEMA countries are slated to rise more than 20 percent to offset declining increases in oil exports from the USSR during 1981-85, as compared with such deliveries during the last 5 years. It is planned to increase CEMA members' production of their substantial reserves of solid fuels and their use of hydroelectric power resources as the USSR develops its West Siberian oil and gas production centers, according to a Soviet authority.

In addition to these oil exports, the USSR also supplies Eastern Europe with about 52 percent of its natural gas requirements. The USSR has stated the intention to increase gas supplies to Eastern Europe, currently about 25 billion cubic meters (m3), by about 10 billion m3 annually when the Yamburg natural gas pipeline becomes operational.

East European technical assistance in exchange for deferred payment of Soviet oil and gas continues as an important factor in the USSR's energy development planning. For example, Poland has recently completed a 485-km pipeline to link the West Siberia - Polotsk crude oil trunkline to the refinery at Mazeikiai in Lithuania, and is participating in construction of the western segment of the trunkline. The encouragement of additional CEMA investment and assistance to Soviet energy development and expansion is likely to lie behind Soviet admonitions to East European countries about the challenge facing the USSR's oil industry to meet their future energy needs.

Oil is the principal hard-currency earner for the USSR and will probably remain so until the Yamburg gas pipeline becomes operational in the mid-1980s. However, the escalating price of crude oil, combined with refinery expansion underway, implies a greater percentage of petroleum products to be exported in the future. This suggests the possibility that a considerable reduction in the total volume of oil exports can be achieved while simultaneously realizing increased earnings. Concurrently, the reduced Soviet oil exports would place additional pressure on other oil producers and prices. Recent Soviet negotiations with West European nations concerning the future prices of natural gas when the Yamburg pipeline is completed also give some indication of what the anticipated price increase of oil will be in the mid-1980s. The negotiated price is being based on the equivalent fuel the gas is expected to replace. This calculation suggests an expected price increase of 28 percent by 1985. Applying these factors to both products and crude, the USSR, with a reduction in total oil exports to Western Europe from the 1979 level of 58.2 million mt to an estimated 1985 volume of 34 million mt would realize earnings of $11.4 billion in 1985 versus $9.5 billion in 1979. This represents an increase in hard-currency earnings of nearly $2 billion despite a reduction in exports of over 24 million mt. Further reductions and increased pressure on oil supplies and prices could be expected in the mid-1980s with the completion of the Yamburg line. Soviet export strategy is to consider oil as a balancing item in international trade accounts, with the actual amount expected in any year dependent upon world oil prices and hard-currency needs.

Natural gas exports should increase from 50 billion m3 in 1980 to 100 billion in 1986-87. About 60 percent of the exported gas is destined for Western Europe, including 20 billion m3 from existing contracts and 40 billion m3 from the Yamburg project. In 1985 this would furnish the USSR with a total revenue from gas of $11.2 billion. Combined with the $11.4 billion from the sale of oil, the hard currency earnings from Western Europe for these resources would total over $22 billion.

The USSR has already profited greatly from escalating oil prices, as in the enormous jump from the relatively stable price of $12.50 a barrel in 1978-79 to $34.50 (Soviet prices) a barrel in 1980. Soviet energy production costs have increased steadily, but remain extremely low in relation to world oil prices. In addition, the USSR is bargaining intensively for maximum gas prices, relating this to the cost of the fuel it replaces.

(9) Economic Considerations

Continued growth in energy production is one of the few bright prospects in the Soviet economic future. Soviet economic growth will average between 1 and 2 percent during 1981-85. Agricultural output will continue to vary with weather conditions, creating a large degree of instability in Soviet economic performance. If energy output rises as expected, it will not be a constraint on economic progress, and the Soviet gross national product will be more likely to expand nearer the top of the range of potential economic growth rates.

Future economic growth will make it less difficult for the USSR to develop its energy resources. The petroleum and gas industries have been given rapid rises in the level of capital inputs, while coal and electric power have been assigned a relatively lower priority. Overall, the share of industrial capital investment allocated to the gas and petroleum sectors has increased from 12.4 percent in 1970 to 17.4 percent in 1979. In contrast, the share of industrial investment going to the coal and electric power industry during the same period has declined from 16.3 percent to 13.2 percent. Investment in energy production during the 1981-1985 period is to increase roughly twice as quickly as total Soviet investment.

Table 34

Expansion of the Soviet Energy Sector
(1970=100)

	1970	1975	1979
Industrial Capital Investment:			
Total Industry	100	139	162
Petroleum	100	152	235
Natural Gas	100	172	196
Electric Power	100	121	130
Coal	100	114	134
Unfinished Construction:			
Total Economy	100	146	203
Petroleum and Gas	100	169	241
Electric Power	100	133	180
Coal	100	107	137

Soviet energy development will be increasingly expensive in the future as harsher conditions in remoter deposits are encountered. The cost of ancillary construction per oil well borehole has risen 30 percent since 1975; the capital investment required per unit of gas extracted in the Medvezhye region was four times greater than in older, more accessible fields; and gas transportation costs have risen sharply. The calculated price for the ancillary construction in 1975 was $131 million and this had increased to about $544 million in 1980. This is a rather small share of the total investments, estimated at $42.5 billion, the USSR stated it had directed to the West Siberian oil industry in the 1976-80 period. The value of the West Siberian oil produced during this period, calculated from OPEC prices, equaled $180 billion. The cost of oil production in two of the large oil associations in West Siberia in 1978-79 was about $1.65 a barrel. Natural gas cost was about 16¢ per thousand ft3 to produce and, with transportation costs added, amounted to about 64¢ per thousand ft3. In the coal industry, the capital investment required per mt of coal produced rose 54 percent during the past decade, while operating costs per mt rose 5.6 percent annually during 1974-77.

If the Soviet Union is to continue to increase the output of energy, these higher costs will have to be paid. The current upward movement of OPEC prices has been a countervailing boon to the Soviet economy. Energy exports alone may be yielding $22 billion annually by the mid-1980s. This level of hard-currency income should allow the USSR to continue to import grain, machinery, and equipment from the West while also providing Moscow the option of increasing economic support to Eastern Europe.

Overall, the Soviet energy outlook is a positive one for economic growth. Even though energy expansion is becoming more expensive, it is clearly a worthwhile investment for the USSR. Future energy growth should both aid economic development and benefit from a higher level of production of the goods and services necessary to further expand energy output.

j. Current Soviet Economic Reform Efforts

The Soviet leadership has not advocated any radical revision in the economic organization of the country, but there are a multitude of marginal reforms under way. Most of these reform efforts were addressed in general terms in the "Decree on Improving Planning and Increasing the Impact of Management on Production Efficiency and Quality" enunciated by the Party Central Committee and the Council of Ministers in July 1979. Some additional changes have been made in light of the two poor harvests since that time and the continued slowdown in economic growth. Many of the reforms have not been fully specified as of this time.

The thrust of the reform efforts is to deal selectively with specific problems while not restructuring the economy in a major way. These efforts amount to applying a small amount of "oil" to the slowly moving Soviet economic "gears". Some marginal improvements can be expected to appear as the reforms are implemented. In earlier years the resulting small increment to growth would hardly have been noticeable, but when economic progress approaches a zero level, any change for the better is significant. Some of the reform efforts are listed in the following table.

Table 35

Minor Soviet Economic Reform Efforts

__Agriculture__

- increased support for private plots
- planning "agroindustrial complex," including equipment supply
- new ministerial structure for fertilizer output
- new "agrochemical service" to improve chemical use
- new Ministry of Fruit and Vegetable Farming

- increased payments to farms for crops

- fewer plan indicators for farm performance

- livestock raising by individuals increased

- elimination of depreciation charges; increased equipment service life

- application of the "Shchekino" incentives for farmers to reduce labor inputs

- two-shift tractor operation

- 20-hour days for trucks shipping grain

- increased speed for trains carrying fruit and vegetables

- 50 percent rail rate reduction for fodder shipments

- drivers recruited for harvest work retain 75 percent of normal wage plus agricultural wage; other workers retain 50 percent

- 25 percent bonuses for operators of large capacity trucks

- provision of grain at no cost as bonuses for drivers

- payment of travel costs for recruited harvest workers by republic Councils of Ministers (probably from reserve funds)

- bonuses of 50 percent for elevator and combine workers' overfulfillment of plan by more than 10 percent

- mandatory harvest work by students in higher education

- allocation of passenger cars and motorcycles as pay to successful agricultural workers

- loans to associations building storage sheds, utilizing a three-year grace period before repayment begins

Industry

- "net output" indicators for bonuses; deemphasize "gross output"

- major price revision to reflect current costs

- price incentives for higher quality products

- price penalties for lower quality products

- energy-saving measures required at plants

- 50 percent bonus paid for the value of energy conserved
- bonuses based on specific contract fulfillment

Capital Investment

- new construction only when peak utilization of existing capacity is insufficient
- payment for work only when completed
- bonuses based on contract fulfillment
- new method of calculating investment efficiency

Labor

- limit on numbers of employees at factories
- bonuses for reducing labor force below plan level
- additional leave for job longevity
- bonuses for job longevity
- greater use of labor placement bureaus
- bonuses for new workers entering high-priority occupations
- increased incentives for pensioners to work
- mandatory assignment of school graduates to specific jobs

Administrative Enforcement

- increased attention by police to transport plan fulfillment
- prosecution for excess energy use
- larger role for People's Control Committees

k. Eleventh Five-Year Plan

The Soviet leadership fully recognizes the impact that the decline in consumer welfare is having on the economy. In both his address to the Party Central Committee in October 1980, and at the 26th Party Congress in February

1981, Brezhnev made clear the leadership's deep concern over the standard of living and its impact on workers.

Brezhnev stated that "improvement of the food supply comes first among the questions on which the living standards of the Soviet people depend." He placed this higher than priorities for fuels, metallurgy, and transportation, which are also pressing problems. However, no realignment of investment priorities has been noted. He did state that the Politburo had decided that a new food program, using an "agroindustrial" approach, is to be initiated in which highest priority will be assigned to those industries supporting agriculture, including procurement, storage, transport, and processing. To accomplish this end, Nikolai Tikhonov, Brezhnev's new economic czar, stated that under the Eleventh FYP agriculture's share of total capital investment will be nearly one-third. This is based on the broad definition which includes the entire agroindustrial sphere. This stress on agricultural investment is to occur while total investment rises only 12 to 15 percent.

Brezhnev also made highly favorable references to Hungarian agricultural practices, which may signal upcoming reforms for Soviet farming.

Premier Tikhonov went on to specify that output from food industries would increase 25%, meat 34%, and other consumer goods 20%. To achieve these goals, grain production is to average 238 to 243 million metric tons (mt) and meat over 17 million mt annually. As shown in the table the grain goal is likely to be unrealistic in view of past performance.

Table 36

Soviet Grain Performance
(million metric tons)

1971-75		1976-80		1981-85
Plan	Actual	Plan	Actual	Plan
195	181	215-220	205	238-243

Even if through some unprecedented development the 238 million mt figure were achieved, imports of 30 million mt would still be required to satisfy the theoretical Soviet goal of one ton of grain per person, or roughly 270 million metric tons. At the same time that plans are being made to greatly increase domestic food output, steps have been taken to ensure a regular flow of large volumes of imported grain over the next 5 years. At this stage long term agreements (LTA) with Canada (25 million mt for 5 years) and Argentina (22.5 million mt for 5 years) have been signed. If a new agreement is signed with the US at the levels the Soviets are suggesting (10-12 million mt annually, or 50 million mt in 5 years), guaranteed minimum grain imports would be 20 million mt per year and nearly 100 million mt over the 1981-85 period. Of course, additional purchases over the minimums, and from other countries, could raise these figures considerably. Soviet actions, such as current efforts to substantially increase their grain import capacity, belie the Plan goals for domestic agriculture and also show that acquiring adequate food supplies externally will remain of paramount importance.

Industry has also been slated to stage a comeback with the value of output to be 26 percent above that in 1980. Due to expected progress in science and technology combined with the slowdown in capital investment and labor force growth, the Soviets claim increased labor productivity is to account for 85 to 90 percent of the growth in production. As shown in the following table, many of the goals are similar to those originally set for 1980. In view of the current state of food supplies, low worker morale, and transportation problems, the 1985 goals shown in the table are not likely to be much more realistic as a whole than when they were set for 1980.

The problem of competition for scarce resources surrounding the new Plan's formulation leads to the conclusion that it is highly unrealistic. There are even indications that decisions made since issuance of the draft guidelines on 3 December 1980 have been so extensive that a complete revision is to be performed by September 1981.

Table 37

Soviet Plan Goals; 1980 and 1985
(millions tons)

	Original 1980 Target	Plan for 1985
Oil	620-640	620-645
Coal	790-810	770-800
Rolled Steel	115-120	117-120
Cement	143-146	140-142

1. Expectation of Accelerated Growth

The targets set for 1981 and the Eleventh FYP as a whole indicate the Soviets are counting on accelerated growth to occur in most major sectors during 1982-1985. This acceleration is very unlikely to occur as labor force growth and increments to capital investment move lower. The table indicates the growth rates needed to meet the FYP target, given complete fulfillment of the 1981 plan.

Table 38

Growth Needed to Meet Plan Targets, 1982-1985
(annual rates)

	1981 Growth	1982-1985 Growth
Industrial Producer Goods (Group A)	4.1	4.9-5.3
Industrial Consumer Goods (Group B)	4.2	5.1-5.5
Labor Productivity in Industry	3.6	4.4-4.8
Machinebuilding and Metalworking	6.1	7.2
Resins and Plastics	3.6	8.7-9.8
Chemical Fibers	4.1	5.3
Electricity	3.1	3.8-4.6
Natural Gas	5.3	7.0-8.7
Real Per Capita Income	2.9	3.0-3.5
Total Agricultural Production	9.5	12.6-15.1
Meat	7.4	15.8-19.9
Milk	2.5	5.1-7.9
Eggs	9.7	15.0
Grain	15.1	16.4-19.4
Capital Investment	5.0	1.7-2.4
Labor Force	1.0	.5

m. Impact of Poland

Events in Poland, a key member of the Council for Mutual Economic Assistance (CEMA) and a major Soviet trading partner, have much to do with Moscow's uncertainty over the new Plan. CEMA was founded to be socialism's answer to the Common Market and as such all members were to derive the mutual benefits to be gained from specialization, shared resources and larger, more efficient levels of production. However, a structure of trade has evolved under which the Soviet Union is the main supplier of raw materials and fuels and in return primarily receives manufactured goods and some minerals from Eastern Europe.

During the 1970's Cuba and Vietnam were permitted to join CEMA and have received large amounts of economic aid. In effect, Moscow has used this device as a means of transferring some of its aid burden to Eastern Europe. Now that Poland itself has suddenly become a recipient of several billion in Soviet aid it is evident that CEMA is no longer a stable trading entity. These troubles have resulted in the refusal to allow entry to CEMA by several African nations because upon joining they would have requested economic aid CEMA could not provide.

Much CEMA trade involved coproduction agreements for specific components. The inflexible nature of planned economies makes it extremely difficult to offset the effects of any developments not generally in line with expectations. Poland has the second largest economy in CEMA and the USSR depends heavily on that country for sulphur, copper, machinery, components, and consumer goods. Consequently, Poland's labor strife and reduced output is being felt in many areas of the Soviet and other East European economies. Statistics demonstrating Poland's trade importance to CEMA are shown in the following tables. In addition to its production, Poland's overland transportation routes and pipelines are absolutely essential to CEMA viability and to Warsaw Pact strategic interests.

Table 39

Poland's Intra-CEMA Trade; 1979
(Percent)

	Share in Poland's Overall CEMA Exports	Share in Poland's Overall CEMA Imports
USSR	61	61
Czechoslovakia	12	11
E. Germany	13	15
Other E. Europe	13	12
Other Communist	1	1
	100%	100%

Table 40

Soviet Imports from Poland, 1979

	Million Rubles	Share of Poland in Overall Soviet Imports by Category (%)
Total Soviet Imports from Poland	3,718	10.2
Machinery, equipment, and means of transport	1,701	11.8
of which:		
Electro-technical equipment	137	28.3
Energy Equipment	48	13.8
Equipment for the food industry	55	16.6
Equipment for the textile industry	46	11.8
Electromagnets	28	79.2
Equipment for the wood, pulp and paper industries	33	15.5
Equipment for the building material industry	12	12.5
Equipment for engineering and road construction	78	34.0
Agricultural machinery and equipment	77	11.5
Rolling railway stock and auxiliary equipment	152	26.7
Ships and ship's equipment	283	23.0
Lacquers and paint	50	23.4
Clothing	215	27.5
Drugs	139	28.5

Table 41

Soviet Exports to Poland, 1979

	Million Rubles	Share of Poland in Overall Soviet Exports by Category(%)
Total Soviet Exports to Poland	3,837	9.1
Machines, equipment and means of transport	985	13.2
of which:		
Underground and surface equipment	28	13.1
Equipment for textile industry	34	21.8
Roller bearings	29	31.9
Tractors	57	21.0
Rolling railway stock	91	43.1
Trucks and complete assembly parts	124	30.1
Oil and oil products	1,109	7.6
Gas	198	9.5
Iron ore (13.4 million tons)	--	34.4
Non-ores, clay minerals and alumina	45	6.1
Crude iron	79	31.1
Potassium salts (1,537,000 tons)	--	32.2
Cultural and household goods	109	22.9

The Soviet leadership appreciates the incalculable costs that would be incurred by a military invasion of Poland. The direct damage and production losses that could result from Polish resistance could be devastating to all of CEMA. The probability of social unrest in other Pact countries would be very high as consumer supplies disappeared. Furthermore, in view of statements by the US and its allies, Moscow must assume that Western reactions to military intervention in Poland would be stronger and more unified than were post-Afghanistan sanctions. A stricter embargo that would include technology transfer as well as grain and other food commodities would further disrupt CEMA at this time of serious economic difficulties. The combination of international embargoes, intra-CEMA disruption, and keeping Poland afloat would entail heavy long-term costs. These considerations, and the prospect of triggering higher NATO defense spending, have figured prominently in the Soviet decision to show an unprecedented degree of forebearance toward Poland.

3. SOVIET MILITARY RESOURCE TRENDS

a. Military Production Capabilities

The Soviet military industrial base is by far the world's largest in number of facilities and physical size. The Soviet Union produces more individual systems in greater quantities than any other nation.

The Soviet industry has grown steadily and consistently over the past 20-25 years. Its physical growth and the commitment of large quantities of financial and human resources is its most dynamic aspect, but its cyclical production is its most important. Production plants appear to be continually active, suggesting that as old weapons programs are phased out, new ones are begun, leaving no down times or long periods of layoffs and inactivity. The cyclical process, the continuing facility growth, and the high rates of production keep the arms industry in a high state of readiness to meet any contingency.

There are 134 major final assembly plants involved in producing Soviet weapons as end products. In addition, we have identified over 3,500 individual installations that provide support to these final assembly plants. The growth in total floorspace has averaged nearly 3 percent per year in the defense industry in the past five years.

Table 42

Soviet Military Production Industry

Ground Forces Materiel	24 Plants
Naval Materiel	24 Shipyards
Aircraft Materiel	37 Plants
Missile Materiel	49 Plants
	134 Total

Approximately 40 million square meters

Construction at Severodvinsk Naval Shipyard illustrates the growth of Soviet facilities over time. Over the past decade seven classes of submarine were produced and during this time floor space increased by several hundred thousand square meters, or approximately three-quarters of its size 10 years earlier. A single new large assembly hall accounted for about 25% of this increase. Severodvinsk is one of five yards producing submarines.

In the aerospace industry, even though there has been significant construction in recent years, including several new large final assembly buildings, the Soviets have revealed that they are constructing a new large aircraft plant at Ulyanovsk. This plant, when completed, will probably be suitable for the fabrication and assembly of a large aircraft, transport or bomber, and underscores the Soviet effort to improve their industrial base. In the aerospace industry, new construction is usually an indicator of a new production technique. A qualitative improvement in production technology, which typically involves newer and more sophisticated equipment, has paralleled the physical growth of the industry.

The army's sector of Soviet military industry is among the largest. Nevertheless its floorspace has expanded by over ten percent in the late 1970's. All segments of the army's industrial-base have been somewhat expanded despite their already massive size. For instance a major Soviet tank plant, which was already nearly five times as large as the two US manufacturers' total area, has again been expanded.

The Soviet Union needs all of these facilities for the 112 individual weapons and weapons systems currently in production.

Table 43

Weapon Types Produced in 1980

Weapon	Number of Types
Bomber Aircraft	2
Fighter Aircraft	6
Transport	3
Helicopters	5
Submarines	9
Aircraft Carrier	1
Cruiser	2
Destroyer	3
Frigate	5
Auxiliaries	8
ICBM	4
IRBM	1
SRBM	3
SLBM	5
ATGM	4
Cruise Missiles	9
SAM	11
ASM	5
AAM	4
Tanks	3
APC	5
Artillery	9
Rocket Launcher	3
Mortar	2
Total	112

The production by weapon type over the past five years is shown below. A five year cut was selected to demonstrate the Soviet ability to sustain high rates of production.

Table 44

Soviet Military Production

	1976	1977	1978	1979	1980
ARMY MATERIEL					
Tanks	2,500	2,500	2,500	3,000	3,000
T-55	500	500	500	500	--
T-64	500	500	500	500	500
T-72	1,500	1,500	1,500	2,000	2,500
T-80				Trial Output	Trial Output
Other Armored Vehicles	4,500	4,500	5,500	5,500	5,500
SP Field Artillery	900	950	650	250	150
Field Artillery	900	1,300	1,500	1,500	1,300
Multiple Rocket Launchers	500	550	550	450	300
SP AA Artillery	500	500	100	100	100
Towed AA Artillery	500	250	100	--	--
Infantry Weapons (Thousands)	250	350	450	450	400
NAVAL SHIPS					
Submarines	10	13	12	12	11
Major Combatants	12	12	12	11	11
Minor Combatants	58	56	52	48	52
Auxiliaries	4	6	4	7	5

	1976	1977	1978	1979	1980
MISSILES					
ICBMs	300	300	200	200	200
IRBMs	50	100	100	100	100
SRBMs	100	200	250	300	300
SLCMs	600	600	600	700	700
SLBMs	150	175	225	175	175
ASMs	1,500	1,500	1,500	1,500	1,500
SAMs	40,000	50,000	50,000	50,000	50,000
ATGMs	30,000	35,000	35,000	40,000	50,000
AIRCRAFT (By Type)					
Bombers	25	30	30	30	30
Fighters/Fighter-Bombers	1,200	1,200	1,300	1,300	1,300
Transports	450	400	400	400	350
Trainers	50	50	50	25	25
ASW	5	10	10	10	10
Helicopters	1,400	900	600	700	750
Commo/Utility	125	100	100	100	100

The production of ground weapons, particularly self-propelled artillery, shows a decline. This represents an old weapon phasing out and a new one starting in production. This type of transition is fairly common in Soviet production practices. Naval ship production demonstrates the capability to sustain high rates throughout. Moreover, the number of auxiliaries produced in Eastern Europe has released Soviet building ways for other projects.

Missile production shows the wide range of missiles in production. Every class of missiles from antitank to ICBM is produced in significant quantities. The only other nation producing such a wide range is the United States; but in substantially lower quantities. The most significant aspect of aircraft production is the sustained high rate of fighter aircraft production. Helicopter production shows a decline at the midpoint, but then a gradual buildup.

These products went both to equip Soviet and Eastern Europe forces and for export. In recent years, in addition to being the world's largest producer, the Soviet Union has become the world's largest exporter of major items of military equipment to the Third World. The perceived domestic need and the export market will keep the Soviet Union the largest active producer of weapons in the world well into the 1980's.

b. Military Spending

The Soviet Union includes a figure for expenditures on defense in the state budget published each year. The specific items covered by the "Defense" appropriation are not revealed by the Soviets, and no breakdown of expenditures by military services or resources has been given in recent years. It is known that a detailed "estimate" (smeta) of expenditures on items for miltary use is compiled each year. The Soviets have not made this "estimate" public, but they have indicated that it is not defined in the same manner as the published "Defense" budget.

The level and trend of the published "Defense" budget in the past two decades have not matched the observed changes in Soviet military manpower, operations, and weapons procurement. Rather than leveling off or declining in the 1970s as the "Defense" budget indicates, Soviet military activities have actually expanded fairly steadily year to year.

The unreliability of published Soviet data on military spending makes it necessary to estimate the level and trend of their military effort using other approaches. The Intelligence Community begins by determining in detail, the manpower and material goods used by the Soviet military each year. These diverse quantities are converted to the common denominator of monetary cost using specific values for each component of the military effort. Both the Soviet ruble and the US dollar are used as common denominators.

Estimated Soviet defense spending in rubles reflects the costs of military activities within the Soviet economy and is meant to replicate, in a general sense, the resource allocation choices confronting the Soviet leadership. Prices and pay rates are those that were in effect in the Soviet Union in 1970. This eliminates the impact of price change and allows the underlying trends in manpower and physical quantities to be revealed. Most of the Soviet military activities are costed directly in rubles. Some items are costed by converting the dollar costs of Soviet activities into rubles using ruble-dollar ratios. These ratios reflect the relative price structures in the two countries.

Ruble defense spending is defined in two ways. A lower range of spending estimates is based on the definition of defense used in the US and is comparable to the coverage of the dollar costs. The definition of spending is broadened in the upper range to include additional military-related activities which the Soviets may view as part of their defense effort. These include civilian space activities, which would be run by the National Aeronautics and Space Administration in the US, construction, railroad, and MVD internal security troops, foreign military assistance, military stockpiling, and some civil defense activities. The rubles values are aggregated by resource category and military service as required for analytical purposes. Estimated ruble defense spending in 1980 totaled between 61 and 66 billion rubles for the narrow definition of defense, and as much as 72 billion rubles for the broad definition. In contrast, the official Soviet "Defense" budget for 1980 was 17.124 billion rubles.

The estimated dollar value of Soviet defense activities represents what it would cost in the US to hire the manpower, procure the hardware bought by the Soviet military, and operate that force as the Soviets did in a particular year. The activities covered by the estimated dollar costs include those military functions which would be funded in the US by the Department of Defense, the Department of Energy, and the Coast Guard. These estimated costs are denominated in constant 1979 dollars in order to remove the effects of inflation and reveal the underlying trends in physical quantities and activities. Dollar costs are useful in determining the overall size and trend of Soviet military activities in terms familiar to US policymakers and in making comparisons with US expenditures on similar activities. The cost of Soviet military activities in 1980 totaled $175 billion. US outlays for similar military activities in 1980 totaled $115 billion.

The incremental cost of Soviet operations in Afghanistan has amounted to less than one percent of total military spending. This cost will rise somewhat if the Soviets choose to directly replace the equipment lost in combat rather than allow reserve stocks to fall slightly for a short period of time.

Since 1978, Soviet military spending has continued to increase at roughly its long-term historical rate of four percent (in constant prices) while economic growth has slowed sharply. Intelligence Community estimates indicate that the share of economic output absorbed by the Soviet military has risen to the range of 12 to 14 percent as a result. While these estimates use the Western concepts of constant prices and gross national product in making these judgments, it is likely that similar trends would appear when Soviet officials made their calculations using current prices and net material product (roughly equivalent to gross national product minus depreciation and services such as education and health).

c. Outlook for Military Resources

The Soviet Union has historically stressed the intimate relationship between economic and military strength. Except during wartime, the share of economic output allocated to the military has been set at a level that allowed for substantial growth in both investment and personal consumption. So long as economic growth proceeded at a rapid rate, military spending could even rise faster than economic output as a whole without causing large shortfalls in either capital formation or the standard of living; the cushion of growth was large enough to allow for such a strategy.

There is currently a significant discontinuity occurring in Soviet military economic reality. With the economic growth rate optimistically planned during 1981 to 1985 at a rate lower than any since World War II, and probably showing negative output trends at least once during the period, the growth cushion no longer exists. The Soviets are facing some very difficult resource allocation decisions.

> The sharpening of the international situation compels the socialist state to increase military production and consumption, while easing of tension permits a decrease, and a fuller utilization of economic might for raising the standard of living of the workers and the development of the national economy. It is impossible to allow, on the one hand, a reduction of military-economic might, for in this case the defense capability of the country would be threatened; on the other hand, an excessive increase in military-economic might can not be allowed because in the final analysis this could

> slow the development of the very foundation of military power--the economy--and do irreparable harm to defense capability.

A. I. Pozharov, The Economic Foundations of the Defense Might of the Socialist State, Moscow, 1981, p. 116.

Soviet leaders, being well aware that economic growth is hindered by military spending, must carefully wend their way between the fulfillment of the conflicting goals of greater military power and an improved economic base. The difficult choices that must be faced during the Eleventh Five-Year Plan have not been made. Preliminary data on the Plan indicate that it is not likely to be fulfilled. The uncertainties that arose following the calculation of the Plan regarding continued supplies from Poland, and the resulting dearth of specific output goals, indicate that the details of the Plan have not been set in final form. A general idea of the intended direction of defense spending growth can be gained from these preliminary figures, however.

Data on planned growth in machine building and metalworking (the key military production sector), capital investment, and consumer durables indicate that substantial room has been left for significant increases in military procurement. It should be noted that there is a large element of uncertainty in these trends due to the preliminary and incomplete nature of the Soviet plan data.

Production of machinery and equipment for use as producer durables in industry and elsewhere is to rise by less than 20 percent by 1985 and production of consumer durables such as refrigerators and automobiles is to rise by 40 percent. However, the output of the machine building and metalworking sector (MBMW) is to increase by 40 percent also. Investment absorbs less than one-half of MBMW output currently, while consumer durables absorb a much smaller proportion. The remainder is largely military procurement, though the export and import of machinery and equipment and some other minor uses of MBMW output should be accounted for as well.

Comparison of the available planned growth rates for each of these subsectors, using the estimated distribution of output in 1980, suggests that the allocation of MBMW output for military purposes could grow at a rate well in excess of that for the economy as a whole, perhaps even as high as 10 percent per year.

Other indicators of Soviet intentions also show that a continued upward trend in military spending is likely. The high priority Soviet leaders place on military power has resulted in continued increases in expansion of military production facilities even as economic growth has slowed. There has been no significant reduction, to date, in the rate of expansion of such facilities.

In addition, the number of weapon systems in development and testing has remained virtually constant for the past decade. Both of these trends point to ongoing increases in military production and procurement.

The October 1980 call by Brezhnev for increased defense industry support to the general economy has not been actualized to any significant degree. Only one explicit indicator, the supply by unspecified defense producers of numerically-controlled machinery to the Ministry of Heavy and Transport Machine Building, has appeared that suggests any degree of implementation of Brezhnev's appeal. It is not anticipated that a significant shift of defense industry resources to civilian production will take place.

There have, however, been attempts to have defense industry produce more consumer goods. The planned growth in consumer durables output by portions of defense industry was highlighted in the guidelines for the Tenth and Eleventh Plan periods, as shown below.

Table 45

Defense Industry Output of Consumer Durables

Defense Industry Sector	Planned Growth During 1976-1980	Planned Growth During 1981-1985
Aviation	50%	45%
Communications Equipment	90%	65%
Radio	200%	80%
Electronics	200%	85%

There was an indication by Brezhnev at the October 1980 Party Plenum that the goals set for the past five years were not met. In reference to the growth of output of consumer durables by heavy and defense industry during the Tenth FYP, Brezhnev stated that "these growth rates must not be allowed to slow down in the next five-year period." By implication, the 1981-1985 growth rates given above should be roughly equal to those actually achieved during 1976-1980. These data suggest that consumer durables output by defense industry is planned to grow slightly faster than MBMW as a whole, but shortfalls from these goals can be expected. The largest of these defense industries, aviation, is not planned to achieve a significantly faster rate of growth of consumer goods output than total MBMW output as a whole in any case. In sum, there is little evidence of any shift in priorities toward consumer goods production in defense industry.

Soviet comments on planned increases in US defense spending have made it clear that there will be a strong response from the USSR. The Soviet military has stressed Brezhnev's statement regarding Soviet actions to counteract increased US capabilities. The military magazine "Red Star" used the quote below on both May 12 and June 9, 1981. At a ceremony honoring those who died in Kiev during the Second World War, Brezhnev said

> We do not support the arms race, we oppose it. We could find a totally different use for the funds it swallows up. But if we are forced to, we will find a swift and effective response to any challenge...

A specific instance of the conditions that would bring about such a response is contained in a May 22, 1981 Brezhnev speech in the Georgian city of Tbilisi:

> I must say with a full sense of responsibility that we cannot leave without consequences the deployment on European soil of new American nuclear missiles aimed at the USSR and our allies. In this case we will have to think about extra defense measures. If necessary, we shall find considerable resources to safeguard our vital interests.

The Soviets are prepared to allocate substantial additional resources to the military, with full recognition of the harm to the economy, if Soviet national security, in their perception, is threatened.

4. CHINESE ECONOMIC TRENDS

China's domestic and international economies are currently going through a tremendously turbulent and confusing period. During the past year, economic policy statements from Beijing have often appeared as directly contradictory to earlier announcements or actions. For example, previous reforms toward decentralization were withdrawn as greater imbalances occurred. Construction contracts with foreign companies were summarily and unilaterally cancelled by the Chinese. Foreign loans were turned down despite earlier pleas for the continued need for hard currency. Much major capital construction was postponed with many facilities left only partially complete and expensive equipment left to rust in makeshift warehouses. These tangles of sudden changes in economic planning are a reminder of one of the late Chairman Mao Zedong's old sayings: "There is great disorder under heaven and the situation is excellent." In other words, turbulent shifts can only make things better. The challenge for Vice Premier Deng Xiaoping and other Chinese economic leaders is to make that adage come true.

a. Post-Mao Planning and Readjustment

Following the September 1976 death of Mao and the subsequent purge of the "Gang of Four," the economic development program promoted in 1975 by Zhou Enlai was enacted as China's prevailing policy and became known as the famous "Four Modernizations." The objective of this program was to turn the PRC into a modern nation by the end of this century through emphasis on the four major economic sectors: agriculture, industry, science and technology, and national defense. During the Spring of 1978 the Four Modernizations policy was promoted by a new Ten Year Plan covering the period 1976-1985. The highly publicized goals of this medium term scheme called for rapid and substantial increases in grain output, steel production, and capital construction through the purchase of foreign whole plants and technology.

China's potential for long-run economic development is enhanced by large reserves of almost all strategic raw materials, a considerable (although technologically weak) industrial base, and a largely self-sufficient agriculture. However, considerable problems were encountered in trying to achieve so much in such a short time. A largely insufficient infrastructure and critical bottlenecks in energy supply and energy transmission, combined with serious shortages of skilled technicians and economic managers, all led to a number of critical imbalances. As a result, in July 1979, the economic leadership scaled down the growth targets for 1985 and reordered the PRC's modernization priorities within a framework of what was called the readjustment period. In addition to the reduction of the production targets previously set, the centerpiece of the readjustment policy was the shift in emphasis from heavy, energy-consuming industry to agriculture and light, energy-conserving industry. Although absolute priority, in terms of expenditures, was still given to heavy industry, an increasing amount of resources was allocated to those sectors that provided food and other consumer goods to the Chinese people or that provided products for the export market. Exports were considered to be essential in order to help provide the hard currency needed to pay for imports of technology and equipment from the West and Japan.

b. Retrenchment

In order to implement the readjustment policies, a number of significant problems were encountered. By late summer 1980, Beijing's assessment of the economy turned more pessimistic. This more sobering evaluation of the Chinese economy was due to the emergence of several difficulties. At the August-September 1980 session of the National People's Congress, top economic leaders announced that oil production would decline in 1980-81. It was also disclosed that there was a record deficit budget in 1979 (three to four percent of GNP) and additional deficits were anticipated for 1980 and this year. This was succeeded in the fall by a slowing of industrial activity combined with a number of economic problems that had been persistent throughout the year. Energy shortages, inadequate supplies of building and raw materials, high unemployment (10-20 percent of the urban work force), plus the combination of excessive investment spending, rising wages, and insufficient consumer goods which fueled inflation (unofficially 10-15 percent) all contributed to the dismal picture.

By December 1980, therefore, it was apparent that the readjustment policies were not working and stronger actions would be necessary. Consequently, Beijing announced that government spending, including military related outlays would be reduced. Investment would be cut back and shifted even more to agriculture and light industry, including the cancellation of several industrial import contracts. In addition, the economic reform of increased decentralization would be relegated to a subordinate position. Early this year central regulations were further tightened to restrict capital investment and control prices.

It was initially reported that the "readjustment" period would be over in 1981. However, with the continuation of the fundamental economic problems and the worsening of others, it is very likely that the "retrenchment" will take considerably longer, perhaps several years.

c. Factory Import Cancellations

A major aspect of the economic retrenchment has been the cancellation of industrial plant purchases from other countries. In late 1980 and early 1981, Beijing cancelled more than $2 billion worth of projects or more than 20 percent of the total volume of plant orders placed since 1978. Hardest hit by these cutbacks is heavy industry that consumes large amounts of oil, either as an energy source or as a raw material. Most light industrial facilities and the offshore oil drilling program are being spared as Beijing simultaneously attempts to decrease energy consumption, increase foreign exchange earnings (through the export of light industrial products), and expand oil production capability. Cancellations include several petrochemical plants ($1.2 billion), steel rolling mills ($700 million), and a copper smelter ($100 million). The cutbacks affected these facilities at various stages of design and construction. Work on some of the petrochemical projects, for example, was already under way when the cancellation orders were given. In other cases feasibility studies had been completed and special equipment had been fabricated. Although it is possible that some additional cancellations of the outstanding $7.4 billion worth of plant contracts may occur, it is expected that Beijing will follow through on most of these other commitments. This is particularly likely in the areas of coal mining, power generation, transportation, and consumer electronics.

Japanese companies, the largest recipients of contracts, were also the hardest hit by the cancellations. Almost 60 percent of the value of suspended contracts was with Japanese exporters. Tokyo regards these unilateral cancellations as unreasonable breaches of contract and has pressed claims for several hundred million dollars in expected losses. Although initially the Japanese companies expressed great indignation over the cancellations, numerous negotiations appear to be working out an acceptable solution to the claims against the PRC. It is also likely that adequate settlements will be reached by Beijing with West German companies that were also involved in the cancellations.

The direct impact of the cutbacks on US firms has been limited. The largest US project affected was a $80 million contract for machinery for a steel mill. In addition, several US firms were to be compensated for technology used in some of the Japanese petrochemical projects. At this point, it is unclear whether these payments were finalized before the contract cancellations.

d. Energy Production

China's output of basic fossil fuels--coal, oil, and natural gas--fell slightly in 1980, ending a decade of steady and often spectacular growth. No industrial sector was more important to Beijing's "Four Modernizations" as its oil industry, which was expected to meet domestic fuel requirements and, concurrently, provide the purchasing power for the acquisition of a vast range of foreign plants, equipment, and technology. This optimism over the oil industry's potential was largely based on the impressive gains registered during the 1970s and on the assumption that rapid growth would continue.

The decline in energy supplies results primarily from technical deficiencies that continue to hamper China's efforts to locate, develop, and transport energy resources, especially oil. As the oil sector expanded, capital expenditures in its support grew increasingly burdensome, often at the expense of other competing sectors and despite years of government encouragement and largesse; China's oil industry is antiquated, poorly managed, and presently incapable of increasing production to levels necessary to support demands at home and export contracts. Domestic techology in the areas of exploration development and oilfield maintenance is quite low in comparison to that of the west. Moreover, these deficiencies are complicated by complex geologic structures that are difficult to interpret and exploit, poor quality oil that is difficult to market and refine, and major fields that are evidently past their prime as producers.

At present, there is a great deal of uncertainty over the future of China's oil industry, and significant improvement is probably 5 to 10 years away. The best prospects for future expansion appear to be offshore. Although exploration along China's continental shelf is at a very early stage, no conclusive judgements can yet be made regarding the existence of commercial scale reservoirs off the coast.

Onshore, the Chinese are struggling to maintain oil production. Western companies are now being asked to aid in establishing better extraction techniques at several older fields and to assist in surveying the vast basins of western China. At present, prospects for greatly improving output at existing fields are not encouraging, and the western basins, even if they prove to have important reserves, are remote, climatically and geographically hostile, and far from potential markets.

China's oil output is expected to remain at or near 100 million metric tons per year over the next five years. Exports will dwindle as the output/domestic demand gap tends to close. Beijing will attempt to mitigate the decline in exports by offering coal in lieu of oil, by strict conservation measures, and by shifting from oil to coal wherever possible. Substantial improvement in oil production is not likely until the mid-to-late 1980s, when, and if, western companies begin to develop offshore concessions. It is highly unlikely, however, that the PRC will become either a major importer or exporter of oil within the next decade.

Table 46

Chinese Energy Production; 1970-1980

	1970-77	1978	1979	1980
Coal (million metric tons)	330-550	618.0	635.0	620.0
Oil (million metric tons)	30-94	104.0	106.2	105.9
Gas (billion cubic meters)	13	14.3	14.5	14.3

e. Economic Assistance Provided

China's economic aid to the non-Communist developing countries is an important part of its foreign policy. During the past ten years, the value of Chinese economic aid has been a reflection of both the domestic and international situation. Even though the total value of economic assistance has decreased from the high levels extended during the early 1970s, the PRC is continuing to spread its influence by helping the developing countries to the extent of its capability.

The level of Chinese economic aid sustained a value of about $600 million from 1971-73, but was scaled down after that as continuing domestic problems required a larger portion of China's resources. In 1974, economic aid fell victim to domestic infighting, and assistance activity plunged to less than $300 million. While China increased aid extensions somewhat in 1975, continuing economic and political problems, exacerbated by the Tangshan earthquake, resulted in further reductions in offered assistance in 1976. Economic assistance to developing countries recovered to a level of about $200 million in 1978 and 1979 as the PRC's domestic situation stabilized. In the last two years, Chinese economic aid levels continued in an erratic path, plummeting to $135 million in 1979 and then rebounding somewhat in 1980, although not to the levels extended earlier in the decade. The geographic distribution of China's economic aid indicates that the sub-Saharan African nations were the recipients of over 50% of the total aid commitments over the past ten years, while Asian countries received almost 25%, the Middle East and North Africa benefitted from a little less than 20%, and Latin America and Europe together registered about 5% of the total during this period of time. Although the countries in Sub-Saharan Africa are clearly of major interest to Beijing as reflected in the geographic distribution of aid committments, new extensions in the last three years to the mid-East and Asia indicate that future deliveries could expand significantly into these areas as well.

Another aspect of economic aid that is closely related to commitments is the number of Chinese economic technicians in host countries. In the early 1970's, the Chinese overseas presence grew steadily, to a peak of over 25,000 technicians in 1975. The level of economic technicians from the PRC remained relatively high until the past two years when Beijing withdrew the level of this support to about 14,000 technicians in 1980. Throughout the past decade, the geographic distribution of China's economic technicians supported the relative shares of economic aid that Beijing offered. Of the economic technicians the PRC has provided to the developing countries, during the period 1971-1980, 85% of the total number of workers were in Sub-Saharan Africa, with about 5% in Asia, 9% in the Middle East and North Africa, and less than 1% in Latin America and Europe.

Table 47

China: Economic Aid Extended to Less Developed Countries (million U.S. $)

Year	Value
1971	583
1972	607
1973	600
1974	282
1975	366
1976	150
1977	197
1978	219
1979	135
1980*	--

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*Not available

Table 48

China: Geographic Distribution of Aid Commitments to Less Developed Countries, 1971-1980

Region	Percent of Total
Sub-Saharan Africa	52%
Asia and Pacific	24%
Middle East and North Africa	18%
Latin America	5%
Europe	1%

Table 49

China: Economic Technicians in Less Developed Countries, 1971-1980

Year	Number of Technicians
1971	19,000
1972	22,000
1973	24,000
1974	23,000
1975	25,000
1976	20,000
1977	24,000
1978	22,000
1979	13,000
1980	14,000

Table 50

China: Geographic Distribution of Economic Technicians in Less Developed Countries, 1971-1980

Regions	Percent of Total
Sub-Saharan Africa	85%
Asia and Pacific	5%
Middle East and North Africa	9%
Latin America	1%
Europe	1%

Note: Numbers do not add to 100% due to rounding.

f. Economic Assistance Received

Although China has provided economic assistance to a large number of developing nations for many years, it steadfastly maintained a policy of self-reliance in terms of being an aid recipient. Even in the face of extreme adversity, such as the 1976 earthquake that almost totally destroyed the city of Tangshan and its surroundings, China shunned foreign assistance, preferring to rely on its own resources. In 1979, however, in a dramatic departure from the traditional policy of self-reliance, China sought financial assistance in the form of grants and concessional loans from non-communist governments and international financial institutions (IFI's). This was followed in 1980 when Beijing sought food and other aid to help meet severe food shortages and related problems in two Chinese provinces. Beijing's requests are important because they signal a fundamental policy shift as the Chinese leadership becomes more open with the West and views the acceptance of aid as a pragmatic approach to solving some of the country's economic problems.

The decisions to accept aid and to play a larger role in the international economic system reflect the leadership's realization that the PRC country could not mobilize sufficient domestic capital to finance its long-term modernization program. More specifically, Beijing's decision to curtail whole plant and large equipment purchases and the rising cost of commercial loans induced the government to adopt its new financial policy.

Bilateral aid packages have provided China with some economic assistance in the past couple of years. Leading the way in November 1979, Belgium and the PRC signed a mixed credit agreement. Under this agreement, the Belgian Government agreed to provide China with yearly interest - free loans of about $10 million from 1980 through 1982. The loans are to be used by the Chinese Government to pay for capital goods or industrial equipment and related services supplied by Belgian firms. In December 1980, China reached a bilateral aid agreement with Australia under which Australia agreed to provide $59 million in aid to be spent on agricultural projects and civil engineering projects. Such relatively small bilateral aid proposals are likely to prove popular with potential donors since they do not require huge outlays and may facilitate donors' entry into specific sectors of the Chinese market. A notable exception to the smaller agreements occurred in December 1979 when Japan offered China a large aid package consisting of about $1.5 billion of concessional loans, to be extended through 1985, for six major development projects. It is unlikely that such large bilateral assistance like that provided by Japan will be imitated since many potential donor nations are struggling with their own economic difficulties and with demands from established aid recipients. However, China's anticipated access to funds through international institutions will provide another source of economic assistance for China in the coming years.

In fact, Chinese involvement in and funding from international institutions could increase dramatically during the 1980s. China and the international financial institutions share a common interest in development projects that individual nations or banks might find too small or unprofitable. Moreover, IFI funds are politically more "neutral" and therefore less suspect in the unlikely event that the Chinese at some future date would pull back from close commercial relations with the West.

China now belongs to several international development and financial organizations. Although its membership in these organizations is fairly recent, the PRC has already availed itself of some economic assistance from these institutions. In June 1979, China received its first multilateral grant from the United Nations Development Program (UNDP) when the UNDP approved a $15 million allocation. By early 1980, the Chinese had fully committed this allotment to approved projects in agriculture, industry, communications, science and trade. It is anticipated that the Chinese will be eligible to receive a significantly increased allocation from the UNDP during the 1980s. Another avenue Beijing has recently explored is funding from the World Bank. It was announced in late June 1980 that China will receive two loans totalling about $200 million to be used to improve educational facilities. It is probable that the PRC will continue to actively seek and use the resources of international economic organizations to develop its economy during the 1980s.

Further evidence that foreign aid is now viewed by Beijing as an important aspect of its overall economic policy came in December 1980 and January 1981 when China admitted international factfinding missions to assess the consequences of natural disasters. UN relief teams estimated that China would need approximately $700 million in aid to fill the emergency needs of Hebei Province which was stricken with drought and Hubei Province which had been ravaged by floods. While world response to the UN assessment has been somewhat slow, the European community pledged $6.2 million worth of food aid in March and Japan has also promised food assistance. The PRC's request for disaster relief aid further indicates that the Chinese have accepted international economic aid as an integral part of their economy.

During the 1980s, China can benefit significantly from external support. While Beijing will not abandon the use of either commercial funds or official supplier credits, its need for large-scale, long-term funding for economic development has made bilateral and multilateral financial aid more desirable.

g. PRC - US Economic Relations

Trade between China and the US has increased dramatically since relations between the two countries were normalized late in 1978. Prior to the normalization of relations, Sino-US trade followed an erratic, "roller coaster" path during the 1970s. Following the establishment of diplomatic relations in January 1979, the United States and China resolved the problems over blocked claims and assets, signed a bilateral trade agreement granting each other most-favored-nation tariff treatment, and concluded a bilateral textile agreement. In addition, the US has granted China permission to borrow from the Export-Import Bank and has given approval for the Overseas Private Investment Corporation to insure US investors in the PRC.

The response to this rapid progression of economic development has been a sharp increase in the US share of China's total imports from 8% in 1978 to 19% in 1980. Purchases from the US rose from $1.7 billion in 1979 to almost $3.8 billion last year. Agricultural commodities accounted for 60% of imports from the US in 1980 and provided more than half of China's annual agricultural import needs. The market for other US commodities such as chemicals, synthetic fibers, wood and paper products also expanded substantially as Beijing's priorities shifted emphasis toward light industry and agriculture and away from heavy industry. While US imports have made dramatic inroads in many areas of the Chinese economy, the China market continues to disappoint US exporters of machinery and equipment. Prior to the improvement of diplomatic and economic relations between the US and the PRC, US firms captured less than 1% of orders in 1978 when China signed contracts for more than $7 billion in Western equipment and technology. In 1979, when many obstacles to US-China trade were being removed, Beijing instituted an austerity program that reflected significant investment cutbacks. As a result, the market for major equipment imports was severely restricted and has never met the early expectations of US manufacturers of heavy industry equipment and steel.

Chinese sales to the US have shown a dramatic rise in the past couple of years, and in 1980 they surpassed $1 billion for the first time. Textile exports were up 74 percent and accounted for 38 percent of total sales in 1980. Crude oil and refined petroleum products, up 42 percent from the 1979 level, were China's second largest commodity export to the US. Despite the sharp increases since 1978, sales to the US continue to account for only about 5 percent of China's total exports. The US is China's third largest export market, far behind Japan and Hong Kong, which together account for 43 percent of total exports.

Although the growth of US-China trade will probably slow over the next few years, bilateral trade prospects remain good. Trade figures for the first quarter of 1981 show exports to the US jumped 85 percent from the same period in 1980 and purchases were also up. The increase in purchases pushed China into the ranks of the ten largest importers of US goods, ahead of Taiwan and Australia. However, Beijing has become increasingly critical of the bilateral trade deficit which hit $2.7 billion last year. Should the bilateral trade deficit continue to widen, Beijing might begin to restrict US imports, especially cotton and synthetic fibers since alternate suppliers are available. However, American willingness to absorb Chinese exports may affect China's decisions on purchasing US goods.

Table 51

China: Major Commodity Exports to the United States (million US $, FOB)

	1978	1979	1980
Total	324	594	1,056
Foodstuffs	27	53	59
Clothing	63	151	248
Other textile products	77	82	157
Chemicals	34	60	110
Crude oil and products	0	95	135
Other	123	153	347

Table 52

China: Major Commodity Imports from the United States (million US $, FOB)

	1978	1979	1980
Total	865	1,724	3,755
Foodstuffs	409	488	1,265
Textile fiber	203	419	895
Chemicals	60	126	386
Iron and steel	negl	163	42
Machinery	90	274	358
Other	103	254	809

h. Economic Planning and Outlook

Since the retrenchment period began in late 1980, the position of the Chinese economic leaders has been strengthened. The new policies are slowly beginning to become effective despite widespread passive resistance from lower level officials. It has also become apparent that the "readjustment" will take considerably longer than the one to two years initially envisioned in 1979 and will likely be extended to the mid-1980s. Although formal Chinese economic plans appear to be changed almost daily, there are indications that rough drafts of a new ten-year plan for 1981-1990 are being formulated. This period would apparently encompass the Sixth and Seventh Five-Year Plans, covering the years 1981-85 and 1986-90 respectively.

Recent experience with economic policy has convinced the Chinese leadership that there are no easy solutions for China's problems and that it will take many years to achieve modernization. In addition, the prevailing policy of having only a limited foreign debt combined with the acknowledged difficulties in utilizing large inputs of advanced Western technology also means that the Chinese must rely primarily on their own resources. Beijing now also appears to recognize that future economic growth will be more difficult and at least for the next several years will be significantly lower than the rate of the 1970s.

Whatever final form the long-term plan takes, the performance of the early 1980s will be crucial. China is presently at a watermark in its economic development, and its near-term ability to overcome its economic problems will effectively dictate the options available in the future. The various reforms and the policy shifts will not, however, be sufficient to rapidly improve China's modernization. Even though Beijing has had a champagne appetite for economic achievements, its beer budget will clearly force the economic leaders to recognize the PRC's limitations.

5. CHINESE MILITARY RESOURCE TRENDS

a. Chinese Military Production

China has maintained a relatively low, yet constant level of military production over the past 6 years in spite of severe economic problems. China has produced 97 various pieces of military equipment since 1975; however, many of these weapons are dated and are considered obsolete when compared to modern Soviet and US weapons.

China recognizes that there is a lack of weapon sophistication and realizes that there are a number of ways to overcome this problem. The first way is the direct purchase of the necessary weapon, the second is the purchase of the technology necessary to build the weapon domestically, and third is the domestic design and production of the weapon entirely in China. In each case, the major problem is the lack of money. According to the "Four Modernizations," a plan to revive China's economy, the military is ranked fourth economically behind agriculture, industry, and science and technology. China's leadership has stated that the development of the nation's economic base is the most pressing need, and, therefore, China's military development will continue to be a slow process well into the 1980s.

Chinese aircraft production during 1975-1980 was comprised of older aircraft designs that are obsolete when compared to modern Soviet and US aircraft. Emphasis was placed on tactical fighter aircraft, with 65% of all aircraft produced falling into this category. The aircraft produced in the largest quantities was the F-6 (Mig-19) Farmer which is a fighter that represents 1950s technology. China also produced two bombers during this time period, providing an offensive capability for the PLA Air Force. These two planes are considered obsolete as they represent technology of the 1950s. Not one new aircraft design was introduced into production during this time period, and the production of one aircraft, the MI-4 hound helicopter, was ceased in 1979.

Chinese missile production during the 1975-1980 time period produced more defensive missiles than any other type because such weapons are cheap to produce and they are necessary to upgrade the PLA's military capability. The missile produced in the greatest quantity in China was an air-to-air missile (AAM) that is a copy of an older Soviet design that was introduced in the 1950s. China began producing an anti-tank guided missile (ATGM) during the past 6 years in response to the massive Soviet tank threat present on China's borders. This ATGM is an adequate weapon but is less effective than more modern ATGMs because it employs an older guidance system that is error prone. The Chinese also produced cruise missiles in quantity during this time period, averaging over 170 missiles per year. These cruise missiles, representing 1960s technology, are employed as both land-based and ship-board weapons. In addition, the Chinese have been producing a surface-to-air missile (SAM) for over a decade. This missile is a copy of an older Soviet design and was produced at a rate of approximately 125 missiles per year for the last 6 years. The SAM features 1960s technology and will probably be replaced on the production line as soon as the Chinese can design a new SAM or purchase a modern missile from a Western nation. The Chinese have been successful in designing and producing ballistic missiles of various range capabilities. China's latest efforts in this field resulted in the successful launching of a long-range ICBM in May 1980. Missiles of this size have the dual role of placing satellites in orbit and providing an offensive weapon delivery capability.

China produced over 35 ground forces related weapons during the past 6 years. These weapons varied from tanks to rifles and, while lacking in modern sophistication, are considered effective. They also give the PLA the capability to defend China from invasion from all bordering nations, except the Soviet Union. The Chinese produce 2 types of tanks with a combined production rate of 600 tanks per year. These tanks are not of the most modern design but are considered effective against all but the most modern Soviet tanks.

During the 1975-1980 time period, China produced over 220 vessels for use by the Chinese Navy. This is a sizable production rate, but these vessels were mainly small coastal patrol craft and auxiliaries of small tonnage rather than large combatants. China also series-produced one type of submarine during this time period at an average of 5 boats per year. China is not considered a major maritime power because the Navy cannot conduct operations far from shore, lacks a modern anti-submarine warfare (ASW) capability, and lacks modern air defense weapon systems.

During the past 3 years there has been a limited expansion of floorspace at known Chinese military production facilities. This expansion amounted to only a 5%-10% increase and represents the financial restrictions placed upon the military and military production by the "Four Modernizations Policy." A survey of 15 major Chinese missile production and research facilities revealed that four of the plants had no expansion, and as a group the plants expanded by about 7%. Expansion noted at shipyards amounted to 5%-10% and falls into two categories, one for the production of naval combatants and the other for commercial tonnage. This separation between civilian and military shipyards should be observed to understand China's naval production capability.

The Chinese have additional floorspace devoted to military production in the form of the Third Line Defense Industries. The decision to build these facilities in the interior of China was made in 1965 in order to counter a perceived Soviet threat. It is believed that these facilities are to be used in the event of war and at present do not greatly contribute to China's military production.

The acquisition of modern weapons by direct purchase or technology transfer has been attempted by the Chinese on a number of occasions. In most cases these negotiations ended in failure because the Chinese made unrealistic contract demands. The most notable exception to this poor negotiating record is the contract with the UK to produce the Spey aircraft engine which will advance China's aircraft engine industry. It must be noted that even with this influx of engine technology, the Chinese will require a number of years to incorporate this information into the aircraft industry.

The problem with technology assimilation can be traced back to the start of the Cultural Revolution. During this time, higher education suffered and was eventually discontinued as the students and professors were sent into the fields and factories to work. In time the Cultural Revolution ended and stability returned to China, but the price to China was high because nearly an entire generation of scientists and technicians was lost to China. With this fact in mind, it is easy to understand why modern technology is difficult to assimilate into China: there is a severe lack of trained or trainable personnel available to work in the factories and the research and development facilities.

Problems with high technology have plagued China in a number of key weapons programs during the last decade. The first is the Chinese advanced fighter program that began in the early 1970s. This aircraft has not reached series-production because the Chinese have not yet produced adequate jet engines to power the aircraft. Propulsion was also the reason for the delay of the launching of China's nuclear powered submarine. In addition, the Chinese submarine-launched ballistic missile (SLBM) is still in the development stage after ten years of effort; the Chinese continue to work on the SLBM but a successful launch will probably not occur until 1982-1983.

China is a major producer of military equipment that makes a wide variety of weapons ranging from rifles to ballistic missiles. However, the items produced lack modern sophistication and many are considered obsolete when compared to modern Soviet and US weapons. Upgrading the military production industry is one aim of the Four Modernizations, but it will take money and properly trained technicians, scientists and engineers. These two resources are in very short supply in China; therefore, China faces a long struggle that may carry on to the next century in its efforts to design and produce modern military weapons.

b. Military Expenditures

An integral part of the modernization of China's armed forces is the expenditures made to pay for the military related resources. Prior to 1979, however, the Chinese did not announce any figures for these outlays. In that year data were provided for the previous years of 1977 and 1978 plus a preliminary estimate for 1979. This figure was later revised upward by 2 billion yuan to reflect additional costs which are believed to be related to the border war between China and Victnam. In 1980, Beijing announced that defense outlays were being slashed by 13 percent to approximately 19.3 billion yuan. Indications are, however, that the reduction was basically a return to the previous upward trend of the late 1970s because the previous year had been abnormally high.

When the initial 1981 military budget was announced, it was anticipated by Beijing that outlays would continue this trend and increase almost 1 billion yuan over 1980 to 20.2 billion yuan. However, the retrenchment policies of late 1980 and early 1981 were adopted and a considerable cut in defense outlays was included in the overall central government budget decrease. Unfortunately, there have been conflicting reports regarding the size of this reduction, making a precise 1981 figure impossible. It appears likely, however, that at least a 5 percent cut is being taken from the initial plan, with the largest reduction being perhaps 20 percent. The resulting range of 1981 military outlays, therefore, is between 15 and 19 billion yuan.

A major problem with the announced figures is trying to determine precisely what the Chinese include in these figures. It is very likely that major portions of the actual military related costs are hidden elsewhere in the central government budget. Estimates of the actual Chinese military costs are approximately double the announced figures, in other words, about 40 billion yuan. Attempts to calculate this value in US dollar terms, using the same analytical model that is used for the Soviet Union, has not provided useful results because of the tremendous differences between PRC and USSR forces. At this time, therefore, no reliable dollar estimate is available.

It can be expected that given the limited resources and competing demands throughout the Chinese economy, military modernization will be a long and slow process. In addition, because of severe adaptation constraints, it would be very unlikely that the Chinese would be able to fully utilize large inputs of advanced foreign technology even if it became available.

Table 53

Announced Chinese Military Budget, 1977-1981
(billion of yuan)

Year	Military Budget	Share of total National Budget
1977	14.9	17.7 %
1978	16.9	15.2 %
1979 (Initial)	20.3	18.1 %
1979 (Revised)	22.3	17.5 %
1980	19.3	16.9 %
1981 (Initial)	20.2	16.7 %
1981 (Revised/Estimated)[1]	15-19	15-19 %

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[1] The revised National Budget is estimated to be approximately 100 billion yuan.

c. Military Aid

Since signing the first military assistance agreement with Indonesia in 1958, the PRC has provided almost $3.5 billion worth of military materiel to 49 developing countries. Three-fourths of this went to countries on China's borders, North Vietnam - $1.6 billion, Pakistan - $630 million, and North Korea - $465 million. PRC aid to Vietnam in support of the war peaked in 1972 with deliveries totalling over $700 million for the year. Until 1979, when all Chinese support to Vietnam stopped, PRC deliveries averaged about $165 million per year, down slightly from the $185 million in the pre-Vietnam period. African countries are receiving an increasing share of Beijing's aid effort. In 1979 China began to use military sales as a source of foreign exchange, discontinuing its policy of granting free aid to selected nations.

Table 54

Chinese Military Deliveries
(Millions of US Dollars)

	Developing Countries Total	Asia	Sub-Saharan Africa
1955-65	205	150	Negl
1966-71	1,120	1,000	50
1972	840	825	15
1973-80	1,295	925	205
Total	3,460	2,900	270

Although China does not have the capability to produce sophisticated equipment such as the Soviet Union offers to developing countries, it has supplied substantial numbers of major equipment items in the last five years. It is expected that future arms deliveries will increase because of Beijing's new arms sale policy.

Table 55

Major Chinese Items of Equipment Delivered, 1976-1980

Ground:	
Tanks	760
Field Artillery	3,360
Naval:	
Minor Surface Combatants	24
Air:	
Supersonic Combat Aircraft	280
Subsonic Combat Aircraft	5
Helicopters	10
Other Aircraft	180

6. SPECIFIC MILITARY TOPICS

a. The Reasons for Poor Morale in the Ranks of the PRC Military

Morale in the People's Liberation Army (PLA) has suffered a decline as a result of party policies. The reported decline in military enlistments is attributed, in part, to the perception that a military career is no longer more desirable than a civilian career. Military salaries have remained static and opportunities for promotions have not increased significantly. The current emphasis on promoting technically competent personnel disadvantages the vast majority of soldiers who are from peasant origins and are poorly educated.

Criticism of the PLA for opposition to incentive-oriented economic reforms, currently espoused by the leadership, has increased in the Chinese media since October 1980. The reforms probably have generated some military morale problems at the lower levels as the income of the military and their dependents falls behind that of comparable civilian workers. This has resulted from the recent workpoint reforms in rural areas which seem to place dependents of military personnel at a disadvantage. The new system distributes earnings according to production and theoretically makes it possible for workers to increase their standard of living substantially. While this provides an incentive for increased production for the general population where the head of the household is a major contributor, military dependents are unlikely to benefit appreciably from the new system. Recognizing this problem, an October notice from the PLA General Political Department requested that soldiers study and support the party's decisions on the "responsibility systems in connection with output" in rural production teams.

The budget announced at the September session of the National People's Congress reaffirmed the relatively low priority accorded the military in the "Four Modernizations" program. Current policies have reduced resources allocated to defense modernization, and extension of this policy over a few more years will further delay an increase in military production and the acquisition of foreign weapons and equipment. Military leaders have acquiesced to current development plans in the hope that a stronger economy will result in increased allocations to the military in the near future. If current economic policies falter, the military may become more actively involved in the political and economic decision-making process.

Another source of military discontent has been the final evaluation on the merits and mistakes of the late Chairman Mao Zedong. Some veteran military officers are opposed to the criticism of Mao and rationalize any of his actions that had adverse effects. Recent publications in the Chinese media indicate that the leadership has decided to reserve, or soften, judgment on the many contentious issues of Mao's past in order to avoid internal conflicts.

It is apparent that PLA discontent is significant enough to warrant continued attention. There have been numerous military meetings at all levels to indoctrinate and educate the PLA in party policies. This renewed emphasis on political indoctrination of the military at all levels has decreased the time devoted to military training, at least temporarily. Party leaders hope to reduce the chances of serious factionalism and civil-military tension by ensuring military support. There is a possibility that discontent in the military hierarchy will increase and the military may become more active in the decision-making process. If this occurs, military-party relations could reach the point where party leadership stability is jeopardized. It is also necessary to provide the military with an environment that will foster a greater emphasis on military tasks so that scientific and technological expertise can be increased and adverse effects on combat readiness can be minimized.

b. Significant Military Events on the Sino-Soviet Border, 1980-1981

Chinese and Soviet troop strengths along their common border as well as that between China and the Mongolian People's Republic remained stable during the past year. Each side maintained approximately one million troops--about 25 percent of all Soviet ground and air forces and about 40 percent of Chinese ground and air forces--in frontier military districts.

In spite of high troop strength, only one minor military incident occurred during the year. In October 1980, four Soviet border guards crossed the Ergune River into the Nei Monggol Autonomous Region. The affair reportedly resulted in the exchange of small arms fire between Soviet and Chinese guards, the deaths of a Chinese herdsman and a Soviet border guard, and an exchange of diplomatic notes and polemics between the Chinese and Soviet Ministries of Foreign Affairs.

The Chinese media described the July 1980 sentencing in three longstanding Soviet espionage cases in Heilongjiang as action taken to "protect national security" and related to defense against Soviet "military provocations." A second July 1980 incident in which a Chinese train bound for Moscow was reportedly stoned by Soviet nationals after crossing into the USSR apparently had no military significance.

Events relating to the border area, but devoid of hostility, included the February-March 1980 consultation on boundary river navigation and the April 1981 protocol on cross-border railway traffic, a routine action.

c. Soviet Reservists Mobilization

Press reporting has discussed the problems of poor discipline, morale, and performance on the part of Soviet reservists called to active duty in August, 1980, in connection with the situation in Poland. According to the reports the reservists "melted" away in such large numbers that effective punishment was impossible, and the senior officers responsible for reserve affairs in the Carpathian Military District were dismissed from their posts. While it is possible that the situation occurred as described, it is not considered likely. Administrative and internal security controls would act to preclude an incident of such magnitude, and to ensure punishment of the individuals involved.

Senator **Proxmire**. Mr. Collins may I say, first, that I am going to suggest, if there is no objection on the part of the members of the subcommittee, that we proceed with a 10-minute rule, in which we each question for 10 minutes, and move in that way.

I first want to start off by telling you how very indebted I feel for the excellent presentation you have given us. As I said in the beginning, we have done this now for 8 years. And this is by far the most comprehensive and scholarly, professional job that I have seen, although they have all been of very high quality. So we are certainly in your debt.

INTERNATIONAL TRENDS AND "THE CORRELATION OF FORCES"

In last year's testimony, the Defense Intelligence Agency said that in Moscow's view, the development of Soviet military capabilities over the past decade was one of the decisive factors in altering world political circumstances in their favor, and a major general was quoted as saying, and I quote: "The correlation of forces" had shifted in favor of socialism.

Now, does your intelligence indicate that despite the international reversals recently experienced that there is a consensus among the civilian U.S.S.R. leadership that the trend is in their favor?

Mr. **Collins**. Yes, sir. There are other statements which represent a slight change in that formulation. And while I can't recall the precise translation, I believe it is "irreversibly and irrevocably," and that is a slight change in the formulation over the past several years.

I judge from the statements which have been made, and they are fairly numerous, that the Soviet political and military leadership have very high confidence in their present military relationship.

Senator **Proxmire**. Well, now, in the past decade, the Soviets have seen China turn against them; they have gotten kicked out of Egypt; they have had serious reversals in Algeria, Libya, Syria; and India asserted its independence from Moscow, as did Indonesia. In the past year, Iraq demonstrated the Soviets cannot control it. And so far, the Soviets have not increased their influence in Iran. Poland threatens to wreck Moscow's East European strategy, and China seems to be moving closer to us, to this country.

Moscow is bogged down in Afghanistan, and was condemned by the Third World for invading that country.

So doesn't this all together demonstrate that their military programs and their military assistance has failed to gain them the influence they desire, and that in spite of the fact that they have confidence, that the best judgment that we can exert is that world trends are not in their favor?

Mr. **Collins**. I think that's very dependent upon what base year one chooses and also upon what factors one selects for judgment. The trends which we have observed are that since 1964, for example, in central Europe, the Soviet Army has converted itself from a quite good and well balanced army with respect to defensive and offensive operations to a much improved army with self-contained division combat elements which are geared for a highly mobile form of offensive warfare.

That army is backed up by a much improved tactical air force, an enlarged tactical air force. At the present time, the Soviets would have a severe problem with respect to the Polish situation; but looking at the balance in central Europe, they cannot help but believe that they have improved their situation.

During the same time period, they have come from a very low point with respect to the United States in the capability for intercontinental nuclear warfare, to a point at which the world accepts them as, and they perceive themselves to be, at least equal to the United States.

During approximately the same period, the Soviet Navy has extended its presence to distant seas of the world, where 15 to 20 years ago a Soviet ship seldom ventured, so that the visibility and the political impact of Soviet offensive armed forces has increased.

We have a statement from the late Marshal Grechko in 1974 expressing his high confidence in the Soviet Armed Forces and stating that the Soviet Armed Forces would have an external role which would expand in the future.

Senator **Proxmire**. Let me just interrupt to say that I think you are making a very powerful case. Your presentation and your prepared statement also documents the military improvement in the forces of the Soviet Union.

But my question was directed at the world trends, and their success not only in developing their own military power but the effectiveness of translating this military power into influence in other countries, in Asia, Africa, and elsewhere.

Mr. **Collins**. I can't say that we have done what we would call a net assessment, but, for example, they have lost influence in Somalia, gained influence in Ethiopia; they have certainly gained influence in the countries adjacent to the Red Sea and the horn of Africa by virtue of the fact that they are able to lean on them with some military muscle behind any political activity.

They have gained a position in South Yemen, which they did not have, and a presence in North Yemen, which is admittedly a minor country. Further south in Africa, they have gained considerably greater influence in Mozambique and Angola. In some cases this was done by proxy, such as in Angola.

In Latin America, certainly Cuba acts as a proxy for them. And parties or government which are Soviet-oriented have come to power in Latin American countries, and are beginning to take shape in [security deletion] and certainly in the small country of [security deletion].

How one would net all this out, I don't know. They certainly have suffered reverses, and certainly the Polish situation has great implications for their future.

AFGHANISTAN

Senator **Proximre**. How about Afghanistan? Has there been—I have read some observations that they have not done well in Afghanistan. They have bogged down. They haven't been able, in spite of their enormous technological superiority and their military strength, compared to Afghanistan, they have had a disappointing performance there. Is that true?

Mr. **Collins**. I think they are disappointed in their performance. I don't know what their expectations were when they went in, but they certainly have not cleaned up the situation in Afghanistan.

OIL PRODUCTION

Senator **Proxmire**. Let me shift quickly to something else. Is it possible that there will be a slowdown in the rate of increase, but no absolute decline, in oil production through 1985 and possibly through 1990?

Mr. **Collins**. That is what we expect; slow growth to about 1985.

Senator **Proxmire**. Then you expect a decline after 1985?

Mr. **Collins**. No, sir, a leveling off.

SALYM FIELD

Senator **Proxmire**. You say the Soviets will manage their oil resources to meet their hard currency requirements, will seek to influence other nations through oil exports rather than ease world supplies or prices. They should not, therefore, be expected to acknowledge large new discoveries such as the one reported last summer in west Siberia.

Was there such a large new find?

Mr. **Collins**. I'm sorry, sir? What was the last part?

Senator **Proxmire**. Do you know whether there was a large new find, in fact, in west Siberia?

Mr. **Collins**. May I ask Mr. Corning to answer that question?

Mr. **Corning**. That was the Salym field, sir, that we had so much publicity about in December. Subsequent reports have indicated that it is a large find, but it will be some time before the Soviets bring it into production.

Senator **Proxmire**. What do you mean by some time? How long?

Mr. **Corning**. Perhaps 5 to 6 years.

Senator **Proxmire**. How large?

Mr. **Corning**. They are talking in terms of a significant find, not as large as the 4.2 trillion barrels reported by Petrostudies, but very large. They will not achieve a large rate of production out of the field by 1985. [Security deletion.]

Senator **Proxmire**. That's a colossal size. That's as large as the entire [security deletion] reserve.

Mr. **Corning**. Yes, sir.

In west Siberia, we are looking at an area equivalent to the Eastern half of the United States. It's a huge area.

POLITICS AND ECONOMICS OF OIL

Senator **Proxmire**. I have time for just one more question. You suggest that Soviet leaders and managers understand the politics and economics of oil so well that they have the capacity to increase or decrease the rate of production over the rest of the decade. Is this what you mean to say? And could they increase their rate above 12.2 million barrels per day if they want to do so?

Mr. **Corning**. We think they could, at this time, sir. In November of last year, they were testing the production by regions. They were running west Siberia at a high level, and then they were reducing it and increasing the production of other regions—always maintaining the 12.2.

Senator **Proxmire**. Thank you.

Senator Abdnor.

GRAIN EMBARGO

Senator **Abdnor**. Thank you. I just have a couple of questions, I guess one of the first things that comes to my mind on Russia is, how effective, supposedly, is that embargo? First, have we had any beneficial effects of the grain embargo that we imposed upon Russia?

Mr. **Collins**. I will ask Mr. Doe to address that.

Mr. **Doe**. Certainly our embargo forced then to pay higher prices for the grain that they in fact did import.

Senator **Abdnor**. How much? We didn't cause anyone else's prices to go up?

Mr. **Doe**. The final impact of that price change can't be calculated yet, because the world market price is still being affected.

Senator **Abdnor**. You would have to admit, other than a little economic, it didn't have much of a political effect? We have never detected any great selloff of cattle or anything because of lack of feed grain. Maybe you did, and I didn't see it. I would like to know.

Mr. **Doe**. There was very little distress slaughtering of cattle. There was fairly substantial reduction in other types of Soviet foodstuffs, things such as feed for chickens; so they reduced their stock of chickens.

Senator **Abdnor**. They actually did that. Are you satisfied that other than the cattle market, the fowl part of it—the ducks, the geese, and the chickens—are involved?

Mr. **Doe**. Yes.

Senator **Abdnor**. How about the milk supply?

Mr. **Doe**. The milk supply dropped substantially in the fall of 1980. By substantially, I mean on the order of 2-to-5 percent.

Senator **Abdnor**. From observing this now, we have had on two occasions, I think, we have experienced embargoes over the years. For instance, soybeans. And you look at the total overall effect both on Russia and America. Would you say that it was effective—considering what it did to this country, in trade, the trade we've lost over the long haul? I am not speaking just of the moment. We're going to be years getting back those markets. We have certainly put South America into the grain business in a big way. Also, I think you also have to recognize that we have very little support from our great allies that we're always talking about.

And under those conditions, would you say it's a very profitable and wise thing to do, for the overall effect?

Mr. **Doe**. I can really only address what the effect is on the U.S.S.R., but certainly we did have a marginal economic impact on the standard of living of the Soviet consumer. We made certain that the Soviets could not increase their supplies of meat to the extent that they had desired. We made sure that they had to import from places that they were not prepared, technologically, to accept imports from. They had to use smaller boats, and this has resulted in tying up their ports and harbors.

We have made sure that they paid over $1 billion extra, probably, for their grain.

Senator **Abdnor**. Additional——

Mr. **Doe**. Over what they would have otherwise paid, had we not embargoed.

Senator **Abdnor**. So we can tell Canada and those countries that we did them a big favor, I guess—increased their economy by $1 billion.

But do you think the Russian people themselves were aware of it, and were unhappy because of what it deprived them of, or that it made them pay extra? Did it have great effects that way?

Mr. **Doe**. There was a very extensive Soviet propaganda campaign both internally and externally that in effect stated that the embargo was a total failure; that only the United States was paying any extra costs.

TECHNOLOGY TRADE

Senator **Abdnor**. Let me ask you one thing: How come we didn't put a little more stop on technology? In Mr. Collins' testimony, apparently, technology is something Russia sadly lacks. Have we put the same kind of an embargo on all our technology to Russia that we did grain? Or did we single out grain?

Was there kind of an—what kind of an embargo was on technology during this period?

Mr. **Doe**. We in fact did increase the strictness of our oversight of technological exports.

Senator **Abdnor**. But did you stop it?

Mr. **Doe**. There were still exports of noncritical technological products to the Soviet Union during the entire embargo period.

GAS PIPELINE

Senator **Abdnor**. I realize, you're not the one who makes the decision, but it must go through one's mind, if we are really trying to put the pressure on them, and technology is something they're falling backward in, I wonder about—like technology—Mr. Collins' testimony also stated the tremendous amount of natural gas they have. I am just wondering what happens when that pipeline is completed to Germany and France, and the problems we have already. Are we putting any input into helping them with that pipeline? Are we supplying anyone private capital, private knowledge, private information, or Government? Is America in any way involved in that pipeline they're now looking at?

Mr. **Corning**. We're not right now, sir. The Russians can buy most of the technology they need for that pipeline from Western Europe or Japan. They have expressly stated that they do not want any U.S. technology that can be embargoed.

Senator **Abdnor**. They don't—where are they going to get the capital? Are they going to borrow it from the World Bank?

Mr. **Corning**. They are getting that from Western Europe.

Senator **Abdnor**. All from Western Europe? It won't come from the World Bank or any of those places?

Mr. **Corning**. The $11 billion will come from private concerns, with Government guarantees.

Senator **Abdnor**. And we're not a party in any way in that financial package?

Mr. **Corning**. No, sir.

Senator **Abdnor**. What do you think it's going to do to our allies in the future, once they get that constant, steady supply of gas? Does that concern our State Department?

Mr. **Collins**. We understand that it is a major concern.

[Security deletion.]

Senator **Abdnor**. That would be quite a problem.

INFLATION

One last thing: Is Russia experiencing inflation?

Mr. **Collins**. Yes, sir.

General **Larkin**. Yes, sir.

Mr. **Collins**. Mr. Doe has studied that question. I'll ask him to answer it.

Senator **Abdnor**. Does that have some effect on their overall economic picture?

Mr. **Doe**. It very definitely does, yes. In the agricultural sector, the Soviets are very proud of the fact that they have basically maintained stable retail prices for food, since, say, 1962 or so. This has cost them heavily, because at the moment they are subsidizing agriculture directly from their State budget to the tune of 10 percent of total budget outlays.

Senator **Abdnor**. You said they are holding the food down by subsidizing it.

Mr. **Doe**. Right; in very much increasing amounts, every year, because the costs of producing the agricultural output are rising very rapidly, on the order of 5 percent a year.

Senator **Abdnor**. When we need more funds, we put in more money and go ahead and keep spending it. Are they able to do that, like the military, while they're short—do they have some means and ways of coming up with the funds they don't have, I guess I should say?

Mr. **Doe**. There is not a competitive fractional reserve banking system in the Soviet Union; there is one bank.

Senator **Abdnor**. So they have only what they have. And with that subsidy in the food, that's that much less they can spend for the military?

Mr. **Doe**. In effect, in the Soviet Union, money in terms of, let's say, actual cash, coin, and demand deposits, doesn't play the same role that it does in the United States. There isn't an inflationary surge from their Gosbank printing more ruble notes. They are clearly experiencing real increased costs, both due to the deterioration of the quality of their raw materials and due to their inefficiency in using the resources that they do have available to them.

This is perhaps best illustrated in the case of agriculture, where you'll see a state farm buying a new tractor or a new combine that costs, say, three times as much as the one that they have just had to retire. But it only does half-again as good a job. That's their technological inefficiency in producing new products.

Senator **Abdnor**. One last question, and I'll quit, Senator. Does their price index reflect quality improvements?

Mr. **Doe**. No; not at all. There are no new products included in their price index.

Senator **Abdnor**. Listen; I'm sorry, but I have to go. Thank you very, very much.

ENERGY

Senator **Proxmire**. A large part of your joint prepared statement is devoted to a detailed description of Soviet management of their energy section, particularly oil. I come away with the impression that energy has been a very high priority of Soviet planners for many years, and they have been quite successful in managing their resources, not only for the medium term, but for the long term as well.

Do you agree with that?

General **Larkin**. Yes, sir.

Mr. **Corning**. Yes, sir; we certainly do.

Senator **Proxmire**. You generally agree. OK.

YAMBURG NATURAL GAS PIPELINE

What role does the Yamburg natural gas pipeline play in Soviet energy plans, and what is the status and remaining issues in the negotiations over the pipeline? Are they stalled because of the uncertainties over Poland, or are Moscow and Bonn bickering over the interest rates?

Mr. **Corning**. In answer to your first part of your question, it's going to be a major hard currency earner for them. We figure with that and what they're selling now, it will be about $11 billion in hard currency by 1985 or 1987, somewhere in that time frame.

The Russians expect to have the contract signed by the end of 1981. They are negotiating on the interest. They want 7¾ percent with a delay period at the beginning of the payback period. [Security deletion.]

Senator **Proxmire**. Welcome to the club. That sure sounds familiar. It happens in this country all the time.

How much leverage does the United States have over the pipeline project because of the participation of U.S. firms and the interdependence of the pipeline with established—let me just ask the first question: How much leverage does the United States have over the pipeline project because of the participation of U.S. firms?

Mr. **Corning**. The only U.S. firm that I have been involved in is Caterpillar tractor. This is where the Russians have asked for Caterpillar tractors of a certain size capacity. We have seen Commerce saying, "We'll sell some of these things to the Soviets." Other than that, they will go to the Japanese for a large number of these things. A certain size capacity of Japanese don't make, and they had to go to Caterpillar for them.

Senator **Proxmire**. Have the Japanese and Germans and other countries that are members of NATO shown any interest or concern in using their leverage to strengthen our negotiations with the Soviet Union, say, in Afghanistan or elsewhere?

Mr. **Corning**. [Security deletion.]

Senator **Proxmire**. Would something as severe as, say, the invasion of Poland, in your judgment, possibly affect these negotiations?

Mr. **Corning**. Very much so. We think it would terminate them totally for about a [security deletion].

Senator **Proxmire**. Why about a [security deletion]. Why wouldn't it have a more permanent effect?

Mr. **Corning**. [Security deletion.]

Senator **Proxmire**. That's the old remark attributed to Lenin, the observation that when the Communists get ready to hang the capitalists, the capitalists will sell them the rope.

Well, I think you answered to some extent Senator Abdnor's question on this, but I'd like to make sure I understand it. Is the interdependence that the pipeline would establish, that is, the dependence by Germany and Japan, on getting 30 percent of their natural gas from the Soviet Union, is that, in your judgment, dangerous to Western Europe and NATO?

Mr. **Corning**. [Security deletion.]

Senator **Proxmire**. Supposing they had a cutoff of 30 percent of their natural gas. Would that paralyze the economies of those countries?

Mr. **Corning**. Thirty percent of the gas represents only about 8 percent of their total energy requirement. The Germans are setting up their factories to run on dual systems. They can either run off natural gas or they can run off oil. So you wouldn't paralyze their industry if you did turn off the gas.

Senator **Proxmire**. Then why is it dangerous?

Mr. **Corning**. Because it establishes a market resource relationship with the Soviets being a great market, earning the hard currency from the sale of energy, with which they can buy technology and equipment from Western Europe.

Senator **Proxmire**. The point you made before, that they want to continue that profitable sale to the Soviet Union?

Mr. **Corning**. Yes, sir.

Senator **Proxmire**. Their greed may overcome their discretion.

How about the longrun effect? Would this ease up the problem of dependence elsewhere in the world, the Middle East and elsewhere?

Mr. **Corning**. We don't think so. The Soviets have, for example, oil people now in Rotterdam who are in daily contact with Moscow as to the prices. Russian oil is really very cheap to produce, but they sell it for about $35 to $38 a barrel. They're making a great deal of money on this. Gas is extremely cheap in the Soviet Union, and at the same time, they want to tie it into the price of oil. And again, they're making enormous profits, from a very small investment.

So, we don't think that they would increase production to ease any situation. If anything, they will keep the market tight in order to make maximum profits.

INFLATION DATA

Senator **Proxmire**. Now, your discussion of capital investment trends is impressive, but it seems to me that whether the trends are favorable or not depends greatly on how the figures are adjusted for inflation. You discuss inflation, but the information you have seems incomplete and largely anecdotal.

Is the lack of data on inflation a basic weakness in our understanding of the Soviet economy? As you said, properly, we can't compare their inflation with our inflation. They don't have the same kind of a money system that we have.

I take it when you talk about their inflation, you are really talking about increased costs in the Soviet Union?

Mr. Doe. Basically, that is correct; yes. It's the cost-push type of inflation, rather than a demand pull like we see the West.

Senator Proxmire. And what they do with inflation, I suppose they use it as an instrument to reduce consumption of the Soviet citizens, and in doing so, shift resources into the military.

Mr. Doe. They have a much——

Senator Proxmire. I think it would be easier, rather than to hold down or reduce the pay of Soviet workers, letting their pay go up, but letting prices go up more.

Mr. Doe. They have a very direct way of doing just that. It's called a turnover tax. It varies from article to article. It can be anywhere from 1 percent of the price of a consumer good to 500 percent of the actual production cost of the consumer goods.

You see very high rates on things like vodka; by doing that, they have a very large source of revenue that also soaks up the otherwise excess purchasing power of their wage earners.

EFFICIENCY OF INVESTMENT

Senator Proxmire. Do we have a basis for measuring, in physical terms, the investment increase that takes it out of—not measuring it in rubles or dollars, but measuring it in the actual physical investment? Is there a way we can do that?

Mr. Doe. We cannot do that directly. But Soviet economic researchers have been looking at that, because they are having a very hard time understanding why their economy is performing so badly. Now they are coming out and saying, "Well, we looked at this entire industry, and what we found was that the values that you think we are investing aren't true values; that is, they are far-inflated values." The best estimate by these Soviet researchers is that the effective capacity is dropping about 6 percent per unit of capital investment per year.

Senator Proxmire. Say that again? Their effective capacity is what?

Mr. Doe. The efficiency of their new capital investment each year is dropping by about 6 percent.

Senator Proxmire. Do you feel confident in that estimate?

Mr. Doe. I think it is a pretty fair estimate for those sectors that were examined by the particular researcher.

Senator Proxmire. How do you know that? How do you know that the efficiency of their new investment is dropping 6 percent?

Mr. Doe. What this particular man did—and he has been around for a long time and written a large amount of fairly nontraditional Soviet economic works—he looked at a series of products that were very homogeneous in nature, that is, a tractor is a tractor—and various other things such as rolled steel or cloth.

He looked at what the new stock of equipment could put out, in terms of tons, in terms of million meters of fabric, for example. He calculated, based on a very wide sample of goods, what quantities you could produce, and compared it to the cost of the machines needed to produce those products.

Senator Proxmire. Have those studies been made public?

Mr. Doe. Oh, yes.

Senator Proxmire. They're in the public sector.

For the record, could you give us a specific reference to it? Not now, but if you could give us the particular studies, so we can get a hold of it, we would like to have it.

You have it?

Mr. Doe. Yes. We refer to it in our joint prepared statement.

PRICE TRENDS

Senator Proxmire. Let me approach this from a little different angle. You argue Government subsidies specifically for consumer products represent hidden cost increases; represent inflation, that is passed on elsewhere in the Soviet economy. At least as far as the Soviet consumer is concerned, he has been largely insulated from the inflation that has occurred in the West, and he observes relative price stability in food, clothing, shelter, energy, and transportation; is that right or not?

Mr. Doe. There have in more recent years been some changes in that.

For example, the price of gasoline was doubled in 1978. The price of housing has not changed, however.

Senator Proxmire. How about food?

Mr. Doe. He is paying a price there that is greater each year, particularly in these last two.

Senator Proxmire. There is inflation in food?

Mr. Doe. Definitely. On the collective farm markets, we have seen about 7 percent per year inflation.

Senator Proxmire. Seven percent per year?

Mr. Doe. Inflation on those markets.

Senator Proxmire. Is that on all food, or just a portion of the food?

Mr. Doe. That's just on those things that are brought to the small markets for open sale, not in the state retail stores. That includes something like 50 percent of all of the potatoes.

Senator Proxmire. The other 50 percent, is that fairly stable in price?

Mr. Doe. Exactly. Those are at the state retail stores, which, however, are now almost empty.

The consumer finds out that those places are not viable stores for food any longer, so he has to buy in the collective farm market.

Senator Proxmire. Then not 50 percent, but 100 percent, of the food is bought in the market, where the price is going up about 7 percent a year?

Mr. **Doe**. It would vary by commodity. It's about 50 percent for potatoes. It's about 30 percent for vegetables. But there is a very small share of meat, however, on the collective farm market.

THE 1981 FOOD CROP

Senator **Proxmire**. I understand there's been a heat wave in the Soviet Union and that food crop plantings were reduced in European regions of the Soviet Union. How would such factors influence their 1981 crop? And what's your estimate for the crop?

Mr. **Doe**. We have a very preliminary estimate, and this is subject to change. Anything that happens this summer could drastically alter our estimate, but it looks like a little below 200 million tons of grain. That's up about 5 percent from 1980.

Senator **Proxmire**. If they do have another poor harvest, will Canada, Argentina, Australia, and the European community be able to satisfy their grain requirements?

Mr. **Doe**. [Security deletion.] They can now, at maximum, import about [security deletion] million tons of grain a year. That's up by [security deletion] or so from last year. So they are in much better shape for importing a lot of grain now than they were before.

SOURCE OF GRAIN IMPORTS

Senator **Proxmire**. Unlike Senator Abdnor and a number of other Senators, I strongly supported the embargo. I thought it was unfortunate we didn't continue it. I thought it was effective.

But how much of the shipments, in the event that the Soviet Union does have a poor harvest, how much of those shipments will now come from this country? Will we go back pretty close to the level we were before we imposed the embargo, or not?

Mr. **Doe**. Current discussions indicate the Soviets would like to renegotiate a new long-term contract with us on a somewhat higher level of guaranteed exports. That is, in the older long-term agreement, we were committed to export 6 to 8 million tons. They would like to see that up in the 10 to 12 million ton range.

So, we would have to export that amount every year, and we would have the option to sign contracts for amounts above that.

Senator **Proxmire**. Does that indicate we have not lost the Soviet market, as some people have claimed?

Mr. **Doe**. It means that we no longer have nearly sole access, like we effectively used to. The Soviets have just signed long-term agreements with Argentina and Canada that, taken together, are equal in size to what they would like to sign with us, about 10 million tons a year.

Senator **Proxmire**. We have lost part of the market?

Mr. **Doe**. Certainly, though it is likely to be a larger market in toto.

SOVIET LABOR UNREST

Senator **Proxmire**. You mentioned work stoppages over food shortages such as those that occurred at the Togliatti and Gorkiy auto and truck plants in 1980 as instances of unrest.

Can you identify specific plants where those or similar incidents occurred?

Mr. **Doe**. Yes, sir. I don't have those here. I could give you a list of the exact plants.

[The following information was subsequently supplied for the record:]

Incidents of Soviet Labor Unrest

[Security deletion.]

PROSPECTS FOR INTERVENTION IN POLAND

Senator **Proxmire**. Will you discuss how tolerant Moscow is likely to be of economic reforms in Poland, and the prospects at this time of Soviet military intervention?

General **Larkin**. I'll take the last part first, sir. The prospects for intervention, of some type or another, are still very high. Philosophically, ideologically, politically, we believe that the Soviets cannot accept a Poland which is not governed by the party and is not an integral part of the structure.

Strategically, they cannot afford to lose it, because the lines of communication and because of the contribution Poland makes to the Warsaw Pact. We don't know where to draw the line on tolerance, and I doubt very much if the Poles know exactly where the line is. But we are inclined to think they have a pretty good handle. They can measure how much the Soviets will put up with, as far as their movement, or their progress, toward a more democratic society is concerned. [Security deletion.] Reaction to this Party Congress is very important, and we expect the Soviets to have to make a major policy decision in that neighborhood.

Senator **Proxmire**. It would appear that Poland at the very least would remain a very nagging and serious problem, in all likelihood, for the Soviet Union, for many years to come, inasmuch as the Catholic Church has enormous strength there. There is a long, long history of resentment on the part of the Poles against the Russians.

I was in Poland a long time ago, but I observed how deeply resentful they were of the Soviets and all the many manifestations they had of resentment in their construction and so forth.

So I think that this would be a very, very difficult problem for them, at best.

General **Larkin**. Yes, sir; it certainly is. [Security deletion.]

IMPLICATIONS FOR WARSAW PACT

Senator **Proxmire**. What are the implications of all this for the strength of the Warsaw Pact, when you have a country so central to the pact, such as Poland, with, as you say, a big standing army, is affected?

General **Larkin**. Much depends on what the Soviets find they have to do to keep the situation under control. Economically, of course, Poland is in very bad straits, and that will be a drag on the Warsaw Pact economy and the Comecon for some time to come.

From a military viewpoint, if Poland stays well within the Pact, well within the Party guidelines of the leadership and there is no disaffection in the Polish armed forces, then there will be basically no effect on the effectiveness of the Warsaw Pact. [Security deletion.]

Consequently, that's why we believe the Soviets will not permit it to happen.

Senator PROXMIRE. Does it seem logical that the Polish citizens who are in the Polish army would not be—I would think they would be bound to be disaffected. After all, they're Polish citizens. They're Catholics. They have the same animus that other Poles seem to have against the Russians—not necessarily the Soviet Union, but something that goes back centuries.

Why wouldn't that continue to be a very, very painful and difficult problem?

General LARKIN. It is a worry to the Soviets. [Security deletion.]

ECONOMIC GROWTH PROSPECTS

Senator PROXMIRE. What will be the likely rate of growth of the Soviet economy if the defense sector grows at the rate of 5 percent per year or higher?

Mr. DOE. The most likely range for Soviet economic growth is between zero and 2 percent, based on a 4-percent rate of growth in defense spending.

Senator PROXMIRE. Between zero and 2 percent?

Mr. DOE. We are looking at something like 1 percent, on the average.

Senator PROXMIRE. Supposing defense spending were reduced. How would that increase the economic growth? And then, assume that it became 6 percent instead of 4 percent.

First, let's reduce it to 2 percent per year.

Mr. DOE. First of all, there would be a long lag time before the military-related resources could be effectively utilized in the economic system. So it wouldn't appreciably alter the slow economic growth for perhaps 5 years.

In this Five-Year Plan, we could see a marginal change—a tenth of a percent, perhaps or two-tenths of a percent—but not noticeable, given the vagaries of Soviet agricultural production and those kinds of things. You would not notice that difference.

Senator PROXMIRE. So that either way, if you had a 2-percent growth or a 6-percent growth, it would have very little effect. In 5 years, it would be a longer period; only a marginal effect in the shorter time period?

Mr. DOE. Only a marginal effect. The key thing here, in my opinion, is that as you approacn zero growth, any increment becomes more significant.

MILITARY BURDEN

Senator PROXMIRE. That's a different view than I got in your presentation, your original presentation, before we had questions. I got the notion that one of the reasons why the Soviet economy had not grown was because of their diversion of resources into the military.

Mr. **Doe**. That is exactly true. And this has been true for the entire time period.

Senator **Proxmire**. Now you seem to be saying it's marginal and very slight.

Mr. **Doe**. What I am trying to refer to is the fact that since World War II, and even before that, the Soviets have devoted a tremendous share of their output of machinery and equipment to the military sphere in the form of tanks, et cetera.

Now, they could have been much more capable as an economic power by now had they devoted less of their output to the military.

Senator **Proxmire**. You were pointing out the enormous number of tanks and planes, and all kinds of hardware that the Soviets were producing. Supposing instead of that, they were producing tractors, machine tools, and so forth? Why wouldn't that have resulted in a significant and definite increase in their economic growth, right now and in the future?

Mr. **Doe**. There is a large time lag before you can get, say, tractors out of a tank plant.

Senator **Proxmire**. I wonder. In World War II, we had very little time lag. Of course, we're a different country than the Soviet Union, but we converted our automobile plants to producing tanks. We converted our enormous industrial plant into producing planes. When President Roosevelt in 1941, after Pearl Harbor, made the announcement of all the tanks and planes, he understated it. It was a gross exaggeration. It turned out we produced a lot more, and a lot quicker, than anyone thought we could.

Why wouldn't that kind of situation govern in the Soviet Union?

Mr. **Doe**. There is a tremendous amount of difference in the way that the Soviet economic system operates, from a managerial standpoint, during a military mobilization versus a slight change in priority during peacetime. There is no indication at this time that the Soviets have any intention of any serious mobilization for either peacetime or wartime production.

Senator **Proxmire**. I am not talking about intentions; I am talking about capabilities.

Mr. **Doe**. [Security deletion.]

So it is a marginal difference, for a significant period of time. Had they altered their priorities in, say, 1960, the last 21 years worth of tractor output versus tank output would by now have made a tremendous difference. But in a short period of time, you can't alter the basic structure.

UNEMPLOYMENT

Senator **Proxmire**. You spoke about employment in China. Is there unemployment in the Soviet Union of significant proportions?

Mr. **Doe**. Not to any significant extent. There is tremendous underemployment; that is, they have half-again as many people at a factory as they need to actually get the job done. A lot of people are in unproductive occupations.

Senator **Proxmire**. What is the total amount, in dollars and rubles, of Soviet foreign military sales and transfers? And are these amounts excluded or included from Soviet defense expenditures? Foreign military sales and transfers, the total amount in dollars and rubles.

In your prepared statement, which I have had a chance to look at, you have figures there showing the foreign assistance in the Soviet Union, but it is not broken down, as I recall, to show the foreign military sales.

Mr. **Collins**. Senator, I believe Mr. Leobold is the best informed witness on that.

Mr. **Leobold**. In the past couple of years, the Soviet Union has surpassed the United States as the No. 1 seller of arms and military systems throughout the world. They had something on the order of $19 billion worth of negotiated contracts, $14 billion of which are new initiatives. And there is $5 billion worth of contracts still to be fulfilled from past initiatives.

So right now they are thinking in terms of $19 billion worth of military assistance, to the whole world.

Senator **Proxmire**. Where do most of these go?

Mr. **Leobold**. The pattern changes. The largest single buyers are the Middle East countries; a lot goes to Africa south of the Sahara; and in recent years, Latin America.

Senator **Proxmire**. Are those annual figures you just gave us?

Mr. **Leobold**. Yes, sir; we have the annual figures.

Senator **Proxmire**. My question was whether or not these amounts are included or excluded from estimated Soviet defense expenditures.

Mr. **Leobold**. I wouldn't know about that. I would think not.

Senator **Proxmire**. They would not be included?

Mr. **Doe**. They're excluded.

Senator **Proxmire**. They are excluded.

You say that—that's interesting, because the most recent publication I saw in the New York Times indicated that this country still sold far more arms abroad than the Soviet Union, in fact, than the Soviet Union and the entire Warsaw Pact and the entire Soviet bloc combined. Of course, the Soviet Union is by far the biggest seller within the Communist bloc.

Mr. **Leobold**. But they in the past year have surpassed the United States. Not by a great amount; something on the order of $1 billion or less. They are selling more than we are. But yes, sir, they are the world's largest now.

Senator **Proxmire**. For the record, could you break that down to the extent that you can? We would like to know how much goes to Cuba and so forth.

Mr. **Leobold**. Yes, sir.

[The following information was subsequently supplied for the record:]

MILITARY SALES—SUMMARY OF WORLDWIDE U.S. MILITARY SALES AGREEMENTS

[Billion U.S. dollars]

	1976	1977	1978	1979	1980
Worldwide total	14.58	8.25	10.89	12.50	15.19
Near East and South Asia	11.25	5.52	7.16	8.31	8.15
Saudi Arabia	7.74	1.89	4.12	6.47	4.54
Israel	.98	.50	1.72	.99	.29
Egypt	.06	0	.16	.45	2.41
Jordan	.36	.10	.07	.09	.35
Europe and Canada	1.38	1.28	1.76	2.11	4.72
United Kingdom	.16	.18	.51	.26	2.95
Federal Republic of Germany	.28	.35	.43	.60	.43
Spain	.12	.08	.19	.10	.46
East Asia and Pacific	1.70	1.26	1.71	1.91	2.24
South Korea	.61	.63	.41	.23	.38
Taiwan	.33	.16	.35	.55	.53
Japan	.04	.04	.34	.48	.45
Australia	.55	.13	.34	.13	.45
Thailand	.11	.10	.11	.42	.23
Africa	.16	.12	.17	.13	.04
Sudan	0	.09	.14	.07	.00
Latin America	.09	.08	.08	.03	.03
Ecuador	0	.02	.03	.02	0

SUMMARY OF WORLDWIDE U.S.S.R. MILITARY SALES AGREEMENTS

[Billion U.S. dollars]

	1976	1977	1978	1979	1980
Worldwide total	8.72	11.16	4	10.25	15.79
Near East and South Asia	4.87	7.57	1.48	6.50	13.59
[Security deletion.]					
Europe	2.20	1.55	1.09	1.45	.87
[Security deletion.]					
East Asia and Pacific	.22	.33	.13	1.32	.71
[Security deletion.]					
Africa	.88	1.53	1.01	.56	.25
[Security deletion.]					
Latin America	.55	.18	.28	.43	.37
[Security deletion.]					

RUBLE COSTS OF U.S. DEFENSE

Senator **Proxmire**. You gave us the dollar cost estimates of Soviet defense. But you didn't give us the ruble cost estimate of U.S. defense.

To make a fair comparison, isn't it necessary to place a ruble estimate on the U.S. side? Is it correct that you still do not make a major effort to do that?

Mr. **Doe**. We mentioned in our oral testimony that the margin of Soviet size over the United States is about one-third, when calculated in rubles. [Security deletion.] This effort is not detailed to the same extent as our estimates of Soviet military costs.

Senator PROXMIRE. Why not? Why don't you do it to the same extent, to give us the complete picture?

Mr. DOE. It would require on the order of perhaps 5,000 man-years to get the same kind of data base on U.S. military activities that we have on Soviet activities. This would include all of the collection and other efforts needed to replicate the exact nature of our Soviet data base.

Senator PROXMIRE. 5,000 man-years? How much do you put into it now?

Mr. DOE. Including all the computer time, probably 3 or so.

Senator PROXMIRE. How much?

Mr. DOE. Roughly 3 man-years, each year.

Senator PROXMIRE. And it would cost 5,000 man-years to do it the other way?

Mr. DOE. To get to the kind of detailed data base that we have in the dollar costs of Soviet military activities yes, as a very rough estimate.

Senator PROXMIRE. That's a degree of detail that I think would be unreasonable.

Mr. DOE. Right. That was our choice.

Senator PROXMIRE. You feel that 3 is about all you can really justify?

Mr. DOE. We have tried it a number of ways, and we found out that at much lower levels of disaggregation on the U.S. cost side, we didn't gain very much more accuracy. That is, there is very little shift in those figures when you go from breaking it down into, say, 4 categories, to breaking it down to 50, to breaking it down to over 100.

So we don't see any reason to go much further.

Senator PROXMIRE. How many man-years do you put into dollar costs?

Mr. DOE. [Security deletion.]

Senator PROXMIRE. Why would it take 5,000 for rubles, if it only takes [security deletion] for dollars?

Mr. DOE. Because we have already developed a multimillion unit data base on the Soviet military activities that are involved.

Senator PROXMIRE. There's no way you could convert that to rubles?

I can't understand why, if you have already developed that data base in dollars, you couldn't convert it to rubles, could not make the calculation in rubles, without devoting 5,000 people every year to doing it.

Mr. DOE. That data base is on the USSR. That is, what we have developed is a tremendous data base on Soviet military activities, which we can then change into ruble or dollar costs; however, we have no independent data base on the U.S. military effort.

Senator PROXMIRE. Let me ask Mr. Kaufman a followup on that. He has a special interest in this, and his questions might be more direct.

Mr. KAUFMAN. Mr. Doe, is it fair to conclude that until an adequate data base is constructed, to estimate the ruble costs of the U.S. defense activities, that there is a very large area of uncertainty in comparing the levels of effort, the resource allocations, of the two countries?

Mr. Doe. I would not characterize the uncertainty as large; no. I would say that the accuracy of our estimates of the ruble costs of U.S. defense activities now is on the order of plus or minus 15 or 20 percent. And I would not expect that if we did a much more significant degree of detail in that analysis, that we would improve that very much.

Mr. Kaufman. How can you know that without doing the analysis, and with only completing a tiny fraction of what you say would be necessary to do it adequately?

Mr. Doe. What we're looking at is a progression over time in our approach to costs for the United States in rubles. At first it was kind of a back-of-the-envelope calculation: You have a rough ruble-dollar ratio for military procurement, for military construction, for military pay, for all of the four or five components, and you would get a relationship that didn't differ significantly from what we got when we used both sides in dollars.

After a couple of years, we thought we should do this in a little bit more detail, so we went to about a [security deletion] break-out of U.S. defense activities, and then applied the ruble-dollars ratios to our dollar costs. Again, it was not significantly different from the results we got using dollars, on both sides.

Each year, we have progressed in the degree of detail that we use in making the calculation. And still, we have gotten into well over [security deletion] categories and it hasn't changed very much. I see little prospect for going to as many as 1,000 categories and getting very much different results from those that we get currently.

Mr. Kaufman. Is there any concern in the intelligence community that in the absence of complete or adequate ruble comparisons that we might be grossly miscalculating the comparative effort of the two countries, and that we might be either overstating or understating the U.S. effort relative to the Soviet effort?

Mr. Doe. We have been very concerned about the likely degree of error in both the dollar and the ruble estimates. And we have done a number of fairly detailed—and in some cases, very detailed—assessments of the likelihood of error from a variety of sources of error.

Our conclusion is that we are no more than plus or minus 15 percent off of what the true value measure of the size of the effort is.

Senator **Proxmire.** Mr. Kaufman's question related to the intelligence community. Does the CIA agree with you? Do other intelligence people agree with that?

Mr. Doe. Yes, they do.

There is no great concern about being grossly misleading in our comparisons of effort level.

SOVIET CONCERN ABOUT MILITARY BURDEN

Senator **Proxmire.** I have an interesting quote from A. I. Pozorov to the effect that excessive military spending could weaken the foundation of military power.

Can you discuss who the author is and how significant it is that a book containing such a statement was published in Moscow this year?

Mr. **Doe**. He is a Soviet Captain First Rank in the military. He is a candidate of economic sciences, equivalent to a Ph. D. He has been assigned to the Lenin Military Political Academy in Moscow and to the Main Political Administration of the Ministry of Defense.

He wrote this book on an unclassified basis; however, he has also in the [security deletion]. I find it very significant that we are seeing an increased level of interest among senior Soviet, particularly military, people, in the interrelationship between the economic system and the military.

BREZHNEV STATEMENT

Senator **Proxmire**. You conclude that there is little evidence of any shift in priorities toward consumer goods production from the defense industry, despite a statement by Brezhnev indicating such a shift is desirable?

What's the evidence that you say is little, and why did Brezhnev make such a statement? To what extent do Soviet defense industries produce consumer products? And is it possible there will be a shift in future years?

Mr. **Doe**. The evidence that I utilized in determining whether or not they had shifted included evidence from all sources, everything from [security deletion] to published Soviet data on the output of consumer durables in industry as a whole.

Senator **Proxmire**. Why did Brezhnev make the statement he did?

Mr. **Doe**. At the October 1980 Party Plenum, Brezhnev was, in effect, urging that the Eleventh Five-Year Plan not be any worse for the consumer than the Tenth Five-Year Plan was. He did not at that time advocate a new shift to consumer goods production by defense industry.

What he was trying to accomplish was to be sure that the output of consumer goods by defense industry not slow down. The planned rate of growth for consumer goods output in the current Five-Year Plan, that one they just entered, showed that he in effect reduced his goals compared to the 1975 to 1980 period. He is hoping to achieve what they actually got rather than what had been planned for, during the past 5 years.

WINNABILITY OF NUCLEAR WAR

Senator **Proxmire**. There has been much discussion on the Soviet doctrine of the winnability of nuclear war with the United States. Do you believe their civilian defense effort demonstrates that they are planning for nuclear war, and believe one would be winnable? And what do the civilian leaders, such as Brezhnev, believe about this? Is there consensus among the civilian and military leaders on this issue?

Mr. **Collins**. If your question is "Do the Soviets plan to initiate a nuclear war?"—the answer would be no, they do not plan to do so. As a matter of fact, everything that we perceive in the civilian leadership indicates a great fear of a nuclear war.

[Security deletion.]

Senator **Proxmire**. Is there any difference between that view and the view that we hold in this country, our leaders do? We obviously have a realistic view—I hope we do—that a nuclear war could occur. We all, obviously, also want to do everything we possibly can to avoid it.

What's the difference?

Mr. **Collins**. First of all, I think there is a more serious acceptance of the possibility that a nuclear war could occur, and a greater degree of preparation for it.

Senator Proxmire. In the Soviet Union?

Mr. Collins. In the Soviet Union. We see that, for example, in the [security deletion] in the very large civil defense effort relative to ours, in the exercise—well, let me refer just to the literature, rather than get into exercise data.

In the literature itself, they point out that one must take into account the combined effects of all kinds of firepower, which includes nuclear firepower. So I would say that it is more heavily integrated into the Soviet political and military planning institutions than it is in the United States.

Senator **Proxmire**. Do you think that there is any significant sentiment in the Soviet Union that if one did occur, they could win it?

Mr. **Collins**. I'm sorry, sir?

Senator **Proxmire**. Is there any significant sentiment in the Soviet Union that if a nuclear war did occur, the Soviet Union could win it?

Mr. **Collins**. That's their intention: They plan to come out in a much more advantageous position.

Senator **Proxmire**. I'm not sure that that is consistent with what I understood you to say to begin with, that they have a great fear of a nuclear war.

If they intend to come out in front, on top, and their philosophy is that world revolution by force and violence in the Communist movement is inevitable, why wouldn't it be consistent to expect that they would believe nuclear war is winnable and that they should——

Mr. **Collins**. Because it would be winnable only at enormous cost.

Senator **Proxmire**. That was it. When I say "winnable," I mean—many people in this country subscribe to the notion that nobody would win a nuclear war—that it would be suicide; that both countries would be destroyed as organized societies. People would still live, probably, but they wouldn't have anything like what is now the Soviet Union or the United States. You would have an absolute wasteland on both sides.

Is that their view?

Mr. **Collins**. That is somewhat their view, although it's not stated in those terms. They say that their general formulation is that, should there be such a war, capitalism would be destroyed, but the Communist system would survive, and in fact become universal. But it would do so only at enormous cost. And the country would experience great suffering. And they say they have no need for a nuclear war, nor, for that matter, any war between States.

Senator **Proxmire**. So there is no real interest on their side of achieving their objectives of world domination by nuclear war?

Mr. **Collins**. No, sir; I don't think so. I think they have a very clear-cut strategy to achieve it, by political means backed up by military muscle.

SOVIET CAPABILITY FOR MATCHING U.S. BUILDUP

Senator **Proxmire**. Is Moscow capable, in your judgment, of matching the United States in any buildup of strategic and conventional forces? If they build up as we have built up—what do we gain on balance?

In other words, if we go ahead with the program the administration has proposed, and build up our forces, can they match it? Will we just be in the same position we were in before?

Mr. **Collins**. Well, I would defer to Mr. Doe on the economic aspects. I would just say that from the standpoint of being mobilized to produce, it would be a long time, as you have seen from these figures, before we even got up to their rate of production, much less them having problems matching us.

Senator **Proxmire**. I am not so sure. I think your figures on numbers were very, very impressive. On the other hand, there is such a difference in quality, or at least in capability. For example, if you compare the number of ships, we have 13 huge attack aircraft carriers. How do you compare that with the number of ships the Soviet Union has? They have two small ones. And you can go right down the line in some areas, where we have obviously far greater firepower, far greater naval tonnage then they have. They may well be ahead of us, but it's very hard to say, is it not?

Mr. **Collins**. Well, with respect to their economic capacity, as I have said, I think they can expand. They are more mobilized than we are, and they can expand the production.

As to meeting the quality standards, I think they would be doing that now, if they could. I don't think they could match us qualitatively.

NATO VERSUS WARSAW PACT SPENDING

Senator **Proxmire**. Former Defense Secretary Brown's final positive statement that total U.S. NATO defense spending exceeded total Warsaw Pact spending last year, could you discuss the relative spending of the two blocs and the significance of the fact that as an alliance we are spending more than they are?

This gets away from your figures. I am not challenging or questioning those. I am talking about total U.S. plus NATO, and compare the Warsaw Pact and part of the Soviet Union.

Mr. **Doe**. When we calculated those costs, we found that, given the level of error that is probabled on both sides, there is no significant difference in the level of spending by the two alliances.

Senator **Proxmire**. What——

Mr. **Doe**. There is no significant difference. Those figures add up to something like [security deletion].

Senator **Proxmire**. Why isn't that a more logical comparison than to simply compare this country with the Soviet Union? After all, NATO alliance is the alliance that we would expect to be in force against the Soviet Union.

Mr. **Doe**. There are a number of reasons why it's difficult to get precise meaning from that total spending comparison. First of all, the degree to which European NATO countries' defense spending is oriented toward the Soviet threat is different in a lot of cases that it is in the United States or Canada. The degree to which, for example, the [security deletion] armed forces would be devoted to a NATO effort in wartime remains somewhat debatable. It isn't clear that you can just add those dollar costs onto a U.S. dollar total and come up with some meaningful figure. Particularly now in the case of the Warsaw Pact it's not at all clear which direction Polish guns would be aimed in the event of war.

Senator **Proxmire**. You also have the mobilization of a quarter of the Soviet military force on the China border.

Mr. **Doe**. That's true, just as the U.S. effort is also not all oriented toward the USSR.

UNITED STATES VERSUS SOVIET MILITARY TECHNOLOGY

Senator **Proxmire**. Will you discuss briefly the United States-Soviet relative military technology in the key areas of aircraft, missiles, surface vessels, submarines, ground equipment, and whether the United States still maintains an overall advantage in technology.

Mr. **Collins**. We would like to supply a more detailed answer for the record, if we may, Senator.

We can say in general that U.S. technology is superior in many areas to the Soviets' technology, but that in some key areas of technology they may have an advantage.

Senator **Proxmire**. Such as?

Mr. **Collins**. [Security deletion.]

Senator **Proxmire**. Is that overcome by our superior antitank weapons?

Mr. **Collins**. I don't think so. I think that's a very serious question at the moment for the U.S. Army and for the NATO armies.

There are other areas in which they have come along tremendously in technology. So that our perception is that our technical advantage has slipped quite a bit over the past 10 to 15 years. [Security deletion.]

Senator **Proxmire**. You have shown that the Soviets have begun producing their T-80 tank. Compare the performance characteristics of that tank with our own M-1.

Mr. **Collins**. I think we would prefer to give you a detailed answer on that, sir.

[Security deletion.]

CHINESE DEFENSE SPENDING

Senator **Proxmire**. Is it true that China reduced its defense budget by 12 to 14 percent this year? And is this a large part of the reason for the low military morale?

Mr. **Collins**. I'll let Mr. Mallon address that, sir.

Mr. **Mallon**. Senator, the Chinese did reduce their defense expenditures by approximately that amount. Not necessarily from what they were spending, but from what they had planned to spend for 1981. The actual amount of reduction was probably somewhat less than that, more on the order of, say, 5 percent.

Military morale is affected to a certain degree because of this defense cut. Other factors that affect the morale include the consideration that the military no longer have the advantages that they once did.

For example, in previous years, the Chinese ex-soldier would have first shot at jobs in factories. He'd have the first shot at schooling. This is no longer the case.

Therefore, there is not the incentive to either go into the service or to remain in the service.

CHINESE-SOVIET RELATIONS

Senator PROXMIRE. Is it also correct that some Chinese military leaders favor improving relations with the Soviet Union?

Mr. MALLON. Yes, sir; it is.

Senator PROXMIRE. How widespread is that?

Mr. MALLON. We don't believe that it is widespread at all. It's isolated. [Security deletion.]

Senator PROXMIRE. Will you discuss the implications of a shift in China's policy toward more friendly relations with the Soviet Union; the likelihood that such a shift may take place in the forseeable future? Not just military leaders, but overall, what prospect is there that this could happen?

Mr. MALLON. You're saying not just military, but across the board?

Senator PROXMIRE. That's right.

Mr. MALLON. The economic relations between the two countries are relatively limited. Neither country currently trades a great deal with the other; it is primarily foodstuffs, some textiles from China, and of course, some equipment that is imported by China from the Soviet Union.

For the most part, we would not expect to see a great deal of economic improvement. If there was, it would not be very significant, certainly not in the near term, the next 4 or 5 years.

In the political sphere, it really could have very far-reaching effects and political ramifications worldwide right now. The Chinese are very careful throughout the world, wherever they go, trying to hold back what they consider as the Soviet thrust throughout the world.

As a very minor example, but I think one that indicates where the Chinese are aiming, in [security deletion] the Chinese have a total staff of approximately 25 people, far in excess of what normally would be needed to maintain the economic, military, political relations between China and [security deletion]. These individuals are there primarily to keep back or to hold the Soviet threat or the Soviet influence in that country. For some other countries, it's similar.

DOLLAR COSTS OF CHINESE DEFENSE

Senator **Proxmire**. Let me ask you another question about the Chinese, and maybe one or two other of you gentlemen would want to join in responding.

One of the things we've done is to compare the Soviet military force with the U.S. military force in dollars, and we do that by considering how much it would cost us to reproduce the Soviet military force. Well, let's apply that to the Chinese. You say there is no reliable dollar estimate available of Chinese military defense spending. Is it correct that no estimate is available because if you made one it would show that they spend in dollars almost as much as we do?

In other words, if we paid with U.S. pay rates the number of people that they have in the Chinese army, that they would spend as much or more, and that such an estimate would be ludicrous in view of the obsolescence of their weapons? Wouldn't such an estimate undermine the reliability of your estimates of Soviet dollar spending?

Mr. **Mallon**. The answer to the first part of your question is yes, sir, it very definitely would be a very large figure, approaching that of the United States; which is totally unrealistic in the case of China. There is a vast difference, however, sir, between the Soviet Union and China in both the makeup of the forces and the structure and number of types of weapons.

Senator **Proxmire**. I accept all that, but one of the reasons the Soviet Union dollar figure is so much bigger is that they have more bodies in the military than we do. It does not necessarily translate itself into greater military capability.

Mr. **Mallon**. I think Mr. Doe could perhaps comment more on the Soviet Union in terms of what portion of the Soviet dollar figure is for pay and allowances or other personnel factors.

Mr. **Collins**. I would comment that in no case are the expenditure figures an accurate measure of military capabilities. They are not intended to be.

Senator **Proxmire**. I think that's right. And I am sure you don't intend them to be. But I think they are interpreted by many people to say, "Look, the Soviet Union is spending twice as much as we do. We have therefore got to spend twice as much as we're spending now."

But as you say, that does not really give you a reasonable basis of comparison.

CHINESE AID TO VIETNAM

According to your joint prepared statement, China still sends aid to Vietnam. Does this aid include military assistance?

Mr. **Mallon**. I beg your pardon, sir?

Senator **Proxmire**. Does the aid that China sends to Vietnam include military assistance? Do they send military aid to Vietnam?

Mr. **Mallon**. Sir, China currently does not send any economic or military aid to Vietnam.

Senator **Proxmire**. We'd better correct the record, because in the prepared statement being read from says:

PRC aid to Vietnam in support of the war peaked in 1972, with deliveries totaling over $700 million for the year. Since then, PRC deliveries have averaged about $165 million per year, down slightly from $185 million in the pre-Vietnam period.

So, the first paragraph, the middle of the paragraph of that preliminary prepared statement, indicates that China, the People's Republic of China, has been sending aid to Vietnam.

At any rate, when you do correct the record, if you find that the prepared statement being read from is correct, please indicate whether or not any of that is military assistance.

Mr. MALLON. Sir, looking quickly at the prepared statement, I did not interpret that to imply that that was the current figure. "Since then PRC deliveries have averaged about $165 million." That was prior to 1979. That was not intended to imply current. We can change the words, sir, to make it more clear.

Senator PROXMIRE. There is nothing in that paragraph that would indicate this is all prior to 1979.

Mr. COLLINS. We will clarify that statement for the record, sir. [Security deletion.]

Senator PROXMIRE. What assurances do we have that the weapons we send to China won't be used against our allies by recipients of aid from China? For example, what if China gave aid to Vietnam, and Vietnam attacked Thailand? How do we know that our weapons wouldn't be used for that purpose?

Mr. COLLINS. Obviously, we wouldn't know that they wouldn't be used. I would think that given the current status of relations between China and Vietnam, that is a very unlikely situation.

CHINESE CANCELLATION OF FOREIGN CONTRACTS

Senator PROXMIRE. With respect to Peking's cancellations of contracts with foreign firms earlier this year, you discussed the status of negotiations with Japan and the implications for the West so far as to the reliability of China as a trading partner is concerned. I understand that they had drastic cancellations that very much disturbed the Japanese.

I am wondering if you think that might undermine their ability to be able to procure technology in the future.

Mr. MALLON. Yes, sir. You're quite correct. The contract cancellations were very substantial, approximately $2 billion worth, approximately 60 percent of that with the Japanese. The current status of the negotiation is that it is up in the air. The Chinese, quite frankly, sir, are looking for a better deal. They're asking the Japanese if they—meaning the Japanese—would provide better financing, in other words, a long-term, low-interest loan to finance these construction projects.

The current status is that it has not been decided. [Security deletion.]

Senator PROXMIRE. It looks like that to me. It seems to me that would undermine the credibility, not only with the Japanese, but with us. After all, if I were an American manufacturing firm, and I just worked one day to get a feel of one, of one in Milwaukee—they had a big contract with the People's Republic of China. It would seem to me that I would be very reluctant to make a contract with a country that was going to back down this way in the future. I'd demand payment in advance.

Mr. **Mallon**. Sir, immediately following the cancellations, the number of foreign businessmen leaving China was very large. It's a roller coaster type of effect in China. The number of businessmen prior to that was quite high. They put long-term leases on buildings, or on office spaces, trying to maintain a presence.

They were very discouraged by this turn of events.

Senator **Proxmire**. On the other hand, this country seems to be going into China.

Mr. **Mallon**. In some cases, we are.

U.S. SALES OF MILITARY EQUIPMENT TO CHINA

Senator **Proxmire**. Including sending them military equipment.

Mr. **Mallon**. Well, sir, selling military equipment is a very new event in comparison with December of 1980 and January of this year. It was the businessmen who were there. The businessmen were there for construction contracts, other types of business deals; they were not there for the military sales.

Senator **Proxmire**. Gentlemen, thank you very much. I think you have done, as I say, an outstanding job in this presentation, and you have been most responsive to our questions. I deeply appreciate it.

We would appreciate having you sanitize the record as soon as you possibly can so we can make it public as soon as possible.

We will have some additional written questions for the record, as well.

General **Larkin**. Senator, may I ask your indulgence on the public release of our final prepared statement? We are working on that.

Senator **Proxmire**. Of course. As in the past, we won't do a thing until you have cleared it, and we will only release what you clear. Absolutely.

General **Larkin**. It's underway, but it hasn't arrived yet, sir.

Senator **Proxmire**. Thank you, the subcommittee is adjourned.

[Whereupon, at 12:05 p.m., the subcommittee adjourned, subject to the call of the Chair.]

[The following additional written questions and answers were subsequently supplied for the record:]

Response of Maj. Gen. Richard X. Larkin to Additional Written Questions Posed by Senator Proximire

DIFFERING ESTIMATES OF SOVIET OIL OUTPUT AND RESERVES

Question 1. I understand the CIA has revised upwards its Soviet oil production estimates. It no longer expects the Soviets to become net importers in the 1980's, and in view of the fact that they are producing at about 12.2 million barrel per day, in the CIA forecasts a 10–11 million barrel per day rate in 1985. Your agency has disagreed with the CIA's Soviet oil predictions and you have been right. Describe the differences in your methodology and state whether you agree with the CIA's revised predictions.

Answer. DIA and CIA both use civilian contractors for reserve analysis. The contractors both use a similar "basin analysis" approach, but the interpretation has varied significantly. In June 1981, the DIA contractors met with CIA analysts and discussed the methodologies and evaluation techniques used in the DIA basin analysis. There was no change in either the DIA or CIA position as a result of this discussion. DIA estimates Soviet oil reserves in the result of this discussion. DIA estimates Soviet oil reserves in the range of 79-85 billion barrels. CIA holds to an estimate of 40 billion barrels. DIA also closely examines the Soviet and East European energy infrastructure, including pipelines, refineries and other aspects. These have relatively long construction lead times and their modification would indicate, several years ahead of time, impending changes in the Soviet-East European oil picture. There have not been any developments which would lead us to the conclusion that the Soviets and East Europeans will increase their imports of Free World oil beyond the present amount.

DIA does not support the CIA estimates of a decline in Soviet oil production, but estimates the U.S.S.R. will achieve its goal of 12.4-12.8 million barrels a day in 1985 and stabilize at that rate into the early 1990's. Soviet primary refinery capacity is stabilized at the present time but there is an expansion of secondary units to process the residuals that should become available from the conversion of oil-burning facilities to gas and coal. The same activity is evident in Eastern Europe. There we estimate the Soviets will maintain their oil exports at the current level through 1990. Concurrently, the East Europeans will be adding sophisticated refining units to process the heavy furnace oils into the more useful lighter products. In Eastern Europe this will occur between 1984 and 1986. After 1990 we expect a gradual decrease in Soviet oil exports to Eastern Europe but the total amount of energy from the U.S.S.R. will not decrease, since gas and electricity will have replaced the oil.

Question 2. For years the CIA has been expecting the giant Samotlor field to peak and decline. Can you explain why it has not and estimate when it will?

Answer. Samotlor probably peaked in 1980. The Soviets reported in "Ekonomicheskiye Problemy Razvitiya Neftyanoy Promshlennosti Zapadnoy Sibiri"(J.D. Karyagin, Moscow, 1975), that Samotlor would peak in 1980, plateau with a relatively stable production for 12 years with a deviation of 10-12 percent. Later reports indicated that Samotlor's reserves were about 2.5 times those of Romaskino, an older Soviet field. This was repeated in another report that indicated Samotlor's reserves were much greater than CIA had estimated. In October 1980, DIA produced a production and decline graph for Samotlor based on the data available plus a modification of Ramaskino's decline. The graph indicated almost flat production through 1986 and then a gradual decline. A Soviet report published in March 1981 stated Samotlor's production would remain at roughly its present time through 1986, confirming the DIA projection. DIA also estimated the remaining reserves in Samotlor at between 18 and 20 billion barrels at the time of the estimate.

NEW OIL FINDS

Question 3. Discuss the new finds that have been made and the new supplies brought on stream since 1977, and your ability as an intelligence agency to make accurate field-by-field assessments, measuring reserve to output ratios and recovery rates.

Answer. The Soviet oil industry appears to be a systematic operation that is well organized and tighly controlled. The fields brought on stream in 1977 were probably known in the 1967-1970 period because this has been the average span of time to prepare the reserves for production. Although much has been made of the additional drilling the Soviets stated would be required in the present FYP, it apparently was planned this way by the Soviets. As early as 1974 the development plan for West Siberia indicated that large fields would be developed first (well yield 584 b/d) followed by fields with well yields 292-584 b/d and finally fields with wells yielding averaging less than 292 b/d. This pattern has been faithfully followed by the Soviets and it has permitted them to design the infrastructure and to move the necessary number of drilling rigs and crews into the area to reach the goal. In October 1980, DIA estimated the number of drilling units the Soviets would require in West Siberia by 1985 would be 450 as opposed to the 155 which were reported in June 1980. In June 1981, the Soviets stated they would require 450 drilling units in 1985 and they had 193 in the area as of January 1981. In addition, the Soviets also had increased the total number of drilling units under the Ministry of Petroleum from 1,280 to 1,363.

The evidence of expanded drilling in petroleum areas and the building of power lines and pipelines are all indicators of development of productive capability. The Soviets have indicated the fields that are to be brought into production and this has generally proven to be fairly accurate. They have also indicated the number of wells that will be required and the yield per well, which is a function of reservoir properties. They also will indicate production levels of some fields and occasionally will indicate what they expect the production level of new fields to be. They have stated they will open 27 new deposits this FYP and that 36 additional areas are being explored.

The U.S.S.R. does not report oil reserves nor reveal the geology or areal extent of the producing regions. These estimates are made through basin analysis as indicated earlier.

WEST SIBERIAN OIL OUTPUT

Question 4. You quote a statement by F. Salmanov calling for revision of the Central Committee draft of the new 5-year plan to increase oil production in West Siberia. What is the significance of this statement, and will the plan be revised in this respect?

Answer. F. Salmanov, the chief geologist for Tyumen, probably has one of the best perceptions of the productive capability of West Siberia. Salmonov did not call for a revision of the present FYP but desired to have the 26th Party Congress state that West Siberian production would reach 500 million tons of oil and a trillion M^3 of gas by 1990. This would indicate continued expansion of Soviet oil production in this region, assuring the USSR of sufficient oil to meet their own needs and those of Eastern Europe and still have some for export. Soviet intentions of meeting the productive goals for 1985 and 1990 will be confirmed if they begin new oil pipeline construction from this area. The capacity of the system now, including the Surgut-Polotsk line, is 6.8–7.2 million b/d. Thus, additional capacity would have to be constructed to meet the goals set for 1985 and for 1990 under Salmanov's statement. This is supported by a briefing that was given by the Minister of Gas and Oil Construction in Moscow in November 1980. The briefer used a map to illustrate future construction efforts and it reportedly included additional oil lines out of Tyumen.

LARGE DIAMETER PIPELINE IMPORTS

Question 5. According to your statement, a cutoff of large diamter pipe to the Soviets would have a severe impact on the expansion of their oil production for several years but would not stop a rise in Soviet production capability. On the other hand, such a cutoff would harm present pipe suppliers in Western Europe and Japan and also affect their economies. Have you quantified these effects, and if so, can you supply the figures to the committee?

Answer. A cutoff of large diameter pipe to the Soviets would affect their expansion of oil production because it is the only transportation mode capable of moving the large amounts of oil produced. The pipeline system from West Siberia is now 6.8 to 7.2 million b/d. If all large diameter pipe were embargoed, the Soviets would either have to use smaller pipe for trunk lines or increase their capacity to roll large diameter pipe. A 48 inch oil pipeline has a 40 percent greater capacity than a 40 inch line. The oil production capability is developed through the preparation and drilling of fields. These can be drilled and then not produced. It is considered production capability.

The Soviets are purchasing large diamter pipe primarily from the West Germans, the Italians and Japanese. In the first six months of 1981 the Soviets accounted for 9.4 percent of Japan's steel exports, taking 1.4 million tons of steel mostly for use in the oil and gas industries. What proportion is for large diameter pipe is not known. The total amount of large diameter pipe required in the 11th FYP is 10,315 miles, weighing approximately 16.2 million tons. It has been reported the Japanese have already agreed to supply approximately 5 million tons. In the past the West Germans have furnished about 750,000 tons per year but the large pipeline rolling capacity may be greater than that. Basic estimates indicate the Japanese may furnish 8 million tons, the West Germans about 5 million, and the Italians the remainder. This only includes the large 56 inch diameter pipe required for gas pipelines so the total tonnage required, including that for smaller lines, would be somewhat greater.

The termination of these sales to the Soviets would have a significant impact on the steel industries in the supplier countries, since the trade probably represents over 10 percent of the rolled steel exports.

A further consideration must be given by the Western producers and exporters of pipe to the additional large diameter lines that will be needed for the transport of the additional planned gas production between 1985 and 2000. The increase between 1985 and the year 2000 is an additional 370 billion M^3 of gas requiring approximately 11 additional large diameter lines with a length of approximately 19,000 miles. This involves almost 30 million tons of large diameter pipe or 2 million tons a year. This is a lucrative market for West European manufacturers.

COAL PRODUCTION

Question 6. In your view, can Moscow meet their new goals in coal, nuclear, and hydropower, and how does electrification fit into their energy plans?

Answer. The Soviets probably cannot achieve their goal for coal output. The 1985 goal, 770–800 million tons, is less than the original goal for 1980 of 790–810 million tons. Soviet production has shown a steady decline since 1978. The 1980 goal was reduced from 805 million tons to 745 million tons. Given the same problems and lack of adequate investment, the 1981 goal will not be met. The coal reserves are certainly adequate for significantly greater production, but they will require increased investment. Electrification is planned to play an important role in the Soviet energy plans. The generation of power is planned to increase from 1,295 billion kwh in 1980 to 1,550–1,600 billion kwh by 1985. This is an oil equivalency of 107 million tons in 1980 and 129–133 million tons in 1985, an increase of over 20 percent. About 14 percent (220–225 billion kwh) of Soviet electricity will be generated by nuclear power at that time and another 14 percent (230–235 million kwh) by hydropower installations. Historically, the Soviet production figures fall about 5 to 10 percent short of planned goals. Hydroelectric production will probably miss by 10 percent and nuclear powerplants by as much as 15 percent. During the next ten years the Soviets will concentrate on the unification of the country's 11 major power systems into a national power system serving most consumers. Presently 9 of the power systems are linked.

In addition to the Soviets plan, mention should be made of the planned programs for Eastern Europe. The following listing indicates the percentages of generating capacity which are planned to be met by nuclear power in the various countries.

PERCENT OF CAPACITY IN NUCLEAR POWER

Country	1990	2000
Bulgaria	40	50–55
Czechoslovakia	30–40	45
German Democratic Republic	20–25	40–50
Hungary	25–28	
Poland		
Romania	25	
Yugoslovia		25

These plans are likely to fall short by from 5 to 25 percent in the various countries. The USSR is not likely to fall short of plan by more than 10 percent.

U.S. GRAIN EXPORTS TO THE SOVIET UNION

Question 7. How much grain has Moscow asked us to agree to sell them under a new agreement, how much have we told them is available during the current agreement year and how much for next year?

Answer. The Long-Term Agreement (LTA) on U.S. grain exports to the Soviet Union, originally due to expire in September 1981, has been extended for 1 year (as of August 1981). The Soviet Union is committed to purchase at least 6 million tons of U.S. grain, and is expected to actually purchase at least the 8 million tons automatically permitted under the LTA. Actual Soviet purchases during October 1980-September 1981 were roughly 10 million tons. The one-year extension is an interim compromise, and further negotiation on a new agreement is expected during the coming year. The Soviets had been mentioning 10 million tons as the desired range for the new LTA minimum export limit. Given the poor prospects for the Fall 1981 Soviet harvest, it is likely that permission to obtain more than 8 million tons of U.S. grain will be sought for this coming LTA year, but no final agreements have been reached.

PROSPECTS FOR AGRICULTURAL SELF-SUFFICIENCY

Question 8. In your judgment is agricultural self sufficiency a possibility for the Soviets in the coming decade and if so, in what areas?

Answer. There is little prospect for Soviet agricultural self-sufficiency in the coming decade. The traditional areas of cabbage, cotton, eggs, potatoes, and some other foodstuffs should remain productive enough in most years to meet domestic needs. Grain output will continue to be a problem area, and large imports are expected to be necessary. The long-term agreements with Argentina and Canada require the USSR to purchase large amounts of grain each year through 1985.

U.S. AGRICULTURAL LEVERAGE

Question 9. In your judgment as intelligence officers, how can our tremendous agricultural advantage be used as a diplomatic lever with the Soviets or do we have any leverage in this area?

Answer. The importance of U.S. agricultural exports to the Soviet Union varies over time depending on the size of Soviet harvests, the availability of alternative sources of exports, and political priorities within the Soviet Union, among other factors. Soviet strategists consider the potential loss of supplies when examining the possible consequences of alternative actions.

If a true dependent relationship existed between Moscow and Washington, the U.S. could expect to gain some political leverage from its agricultural advantage. During the recent grain embargo, other countries supplied the USSR grain, replacing much of that which Moscow had intended to buy from the U.S. As long as other countries are willing to meet Soviet agricultural needs, the U.S. will not have a strong lever for influencing Soviet behavior.

ECONOMIC IMPORTANCE OF POLAND

Question 10. What is the level of Soviet subsidies to Poland, to what extent have Polish deliveries of goods to the Soviets been reduced in the past year, and how would you assess the importance of Poland to the Soviet economy?

Answer. Poland's industrial performance for the first half of this year has shown a steady deterioration in several key industries. Overall industrial production declined by 17.2 percent compared to the same period last year, with coal down by 21 percent, machine tools by 36 percent, and car production by 26 percent.

In an effort to prevent a total economic breakdown, the Soviet Union has been providing Poland substantial assistance. Since last August, the USSR has supplied Poland with about $4 billion in the form of hard currency, energy, raw materials and other goods.

During January-May 1981, Polish imports from the USSR jumped 15 percent, with the largest increase noted in the delivery of raw materials and consumer goods. Exports to the USSR, on the other hand, dropped about 20 percent. As a result, Poland recorded an $870 million trade deficit with the USSR during this period, which is well above the $30 million deficit reported in the same period last year. This trade deficit, which is in effect a Soviet trade credit, is another form of Soviet assistance to Poland. The trade deficit will amount to over $1.5 billion this year and is likely to continue at that level. The Soviet Union has also pledged to defer all Polish debts until 1986 and to provide emergency supplies of food, raw materials for its light industry, consumer goods, and other aid in an effort to shore up the embattled Polish economy. Deliveries from the USSR to Poland during the first six months of this year included:

Crude oil, 6.64 million tons; natural gas, 2.56 billion cubic meters; iron ores, 7.88 million tons; and cotton, 75,700 tons.

The Soviets have good reason to prevent a total Polish economic breakdown. Within CEMA, Poland's economy is second only to that of the USSR in size and importance. Poland accounts for over one-fourth of Eastern Europe's economic output and has a 10 percent share in total Soviet turnover, and moreover, its heavily interdependent trade ties with its communist partners make it absolutely key to CEMA viability.

Soviet production is geared toward the heavy industry and defense sectors, and its light and consumer-oriented industries are considerably dependent on Polish, as well as other East European, production. The most important products for the Soviets include Polish coal, electrical engineering products, ships, spare parts, components, sulphur, chemical products, railway stock and equipment, clothing and drugs. If Soviet defense outlays are increased, dependence on Polish/East European light and consumer-oriented production would increase as the USSR's own production in those areas is given even lower priority. Moscow can ill afford to lose Polish industrial output, or even worse, be forced to carry the burden of Poland when their own economy is not performing well.

TARGETS IN THE 11TH 5-YEAR PLAN

Question 11. How do you account for the absence of steel and other production targets in the new Five-Year Plan? Is it possible such details will be included in a revised plan and when would such revisions be made?

Answer. The absence of a production target for the Soviet showcase industry—steel—in the Eleventh Five-Year Plan is due primarily to the failure to meet production goals in the Ninth and Tenth Five-Year Plans, as shown here:

Year	Production (million metric tons)		Percent of plan achieved	Growth rate	
	Plan	Achieved		Plan	Achieved
1975	146.4	141	96	22–29	21.5
1980	156.8	147.9	94	13.5–20	5

The failure to meet the Tenth Five-Year Plan was blamed on several problems: inability to bring on line 7.4 of the 14 million tons of steel-making capability reported by the Soviet press; transportation problems of raw materials; and the fatigue of men and machines caused by pushing to meet quotas.

This failure to meet planned production targets for two consecutive Five-Year Plans is a major setback to the propaganda value of this critical industry. As a result, the Soviets no longer feel it is in their best interest to publish steel production targets in the Five-Year Plan.

A review of available Soviet literature suggests a 1985 goal of 165 to 168 million metric tons of steel. This target appears to be overly optimistic based on the growth rate of the last Five-Year Plan and the apparent change in emphasis from quantity to quality in steel production.

Plan goals for many other major economic sectors were also missing from the published guidelines. The guidelines contained roughly one half as much detail as the Tenth Five-Year Plan guidlines. This failure to set specific targets reflects uncertainty among Soviet planners regarding the resource allocation priorities set by the political leadership as well as reluctance to reveal the expected poor performance, as in the case of steel. There will very likely be greater detail provided as the Plan is finalized for expected approval in October 1981.

SOVIET METALLURGY

Question 12. Discuss the status of the large metallurgical project at Kursk and the role of metallurgy in the new Five-Year Plan.

Answer. The direct reduction steel plant at Staryy Oskol, in the Kursk Magnetic Anomaly, is still in the early stages of construction. The foundation of the furnace building and the major furnace stacks are nearing completion. The Eleventh Five-Year Plan targets this facility for completion by 1985.

The first stage of the facility was scheduled for completion in late 1978 with a capacity of 1.5 million metric tons of finished rolled products, but completion was delayed by numerous problems between the German contractors and Soviets, and within the Soviet ministries.

It appears that the Soviets have resolved most of the bureaucratic, diplomatic, and economic questions that have plagued the project. Therefore, this innovative process—the direct feed of electric furnaces with super rich iron pellets—could be operational by 1985. However, it is doubtful that the planned capacity will be completed before the late 1980's.

The direct reduction steel making process was lauded by the Soviets as the technology that would lead their steel industry to greater proficiency in the 1980's. This process requires ore with an iron content of more than 60 percent. But rich ore is not readily available in the quantities needed for this process to have a major impact on the steel industry. Further, it will take a decade and enormous capital investment to develop direct reduction to a scale where it would have a significant impact on Soviet steel making. This technology is not the panacea the Soviets once envisioned.

The Eleventh Five-Year Plan calls for maintaining hard-won production levels while improving, concentrating, and refining technologies. This is a major departure from previous Five-Year Plans which emphasized production expansion over product quality. Another departure is the lack of industry-wide statistics on projected growth rates. Instead the plan cites production targets for only specific sectors (for example, finished rolled steel—117 to 120 million metric tons) of the metallurgical industries.

The specific metallurgy tasks cited in the plan are subdivided into ferrous and nonferrous, as follows:

Eleventh 5-Year plan for ferrous metal

Product	*Production target*
Finished rolled steel	117 to 120 million metric tons.
Heat hardened rolled low-alloy steel	Increase production of these items by 50 to 150 percent.
Sheet and tin plate with protective coating.	
Dynamo steel	
Special and high precision rolled sections.	
Metal powder	200 percent increase in production.
Electric steel	60 percent increase in production.
Steel casting by continuous-casting	35 to 37 million metric tons.

The plan calls for increased metal production through better ore concentrating technologies. This is in response to the steady decline in the iron content of ore. It is forcing the Soviets to develop concentration and pelletizing technology for processing low-grade oxidized ferrous quartzites. This technology is vital in the short-term for increasing steel production and for the long-term in maintaining production levels.

The acknowledgement of a decline in metal content of manganese and chromium ores is significant because these metals are needed in steel alloys. Thus, the Soviets must develop better concentrating facilities to produce industrially acceptable grades of these essential ferrous metal ores. Another departure from the previous plans (which stressed large scale centralized steel production) is the emphasis on small regional electric steel plants which process ferrous scrap for use in local steel consuming industries.

ELEVENTH 5-YEAR PLAN FOR NONFERROUS METAL

Nonferrous metal	Production target (percent)	
	11th 5-year plan	10th 5-year plan
Aluminum	15 to 20	120 to 130
Copper	20 to 25	120 to 130
Nickel	30	120 to 130
Cobalt	30	
Titanium		140

The plan broke precedent by not publishing overall growth targets for the nonferrous industry. It does indicate a major decrease in production goals from the 10th Five-Year Plan and the replacement of a titanium target with a cobalt target. The deletion of titanium indicates that its production level is sufficient to meet current needs. Cobalt is critical to superalloy production. Also, magnesium and niobium were included for the first time as metals whose production needs to be increased; they are needed for specialty alloys.

The shift towards quality improvement is reflected in the emphasis on specific technological products and processes—that is, precision metals, bimetals, and metal powders. Their development is vital to increasing the sophistication of the military industrial base.

The apparent approach to increasing production is to complete plants already under construction, and more importantly, to increase labor productivity at existing facilities. This is to be accomplished by introducing automation and computerizing technology at production sites.

The plan stresses the need to improve raw materials supply by developing rich nonferrous ore deposits, and improving extraction technologies. These developments are to occur in areas north and east of the Urals.

The Soviets will experience problems in meeting production goals. Among these are the slowdown in manpower availability, the remoteness of untapped ore deposits, and the enormous capital required to develop the necessary infrastructure to open these deposits. It appears that the Soviets will implement these actions as appropriate in each individual industry to preserve the long-term domestic self-sufficiency goals for that particular industry.

BAIKAL-AMUR RAILROAD

Question 13. In your statement you say the new Baikal-Amur railroad through the eastern USSR was extended somewhat in 1980. When will it be completed and what are the implications of its completion?

Answer. The Soviets originally proclaimed the new Baikal Amurskiy Magistral (BAM) railroad would be completed and operational in 1982, but have recently updated the completion to take place in the latter part of 1983 or early 1984. In comparing the present rates of construction of the BAM with other past Soviet undertakings, and the amount and type of work yet to be done, we estimate that the completion of the entire line will not be achieved before 1985.

Although this railway is primarily for economic exploitation, it will be of strategic military value in that it will provide an alternate rail route across Siberia far removed from the Chinese border. At present, the Transiberian is the only railroad that connects the USSR Far East with the central and western portion of the country, with parts of the Transiberian running close along the border with China.

MILITARY ASPECTS OF THE 5-YEAR PLAN

Question 14. You say that the draft guidelines of the new 5-year plan indicates the leadership has opted for future growth in military strength. I understand the guidelines don't contain much detailed information about the military sector. Discuss how you arrive at your conclusion based on the language in the draft guidelines.

Answer. The draft guidelines for the Soviet economy during 1981–1985 do not directly address military spending growth. Soviet plan data do, however, cover growth rates for some of the activities that relate to military spending. The plan calls for 40 percent growth in machinebuilding and metalworking output during the five-year period. This output is to be allocated to capital investment, consumer goods, and military hardware. Growth in capital investment is to be only 12 to 15 percent, with the share of machinery to rise slightly within total investment. Consumer goods output is to increase by 40 percent. The remainder of machine-building output, which is largely military hardware, would then increase by more than 40 percent if the plan is fulfilled. These data are approximate and do not cover all of the smaller sources and uses of machinery in the Soviet economy, but they do suggest that their is room for rapid growth in military procurement within the plan guidelines.

MILITARY IMPACT ON THE MACHINERY SECTOR

Question 15. You mention problems in the machine building and metalworking sector and the slowdown in growth of manpower. How will the manpower and procurement requirements of the military affect the machine building and metalworking sector?

Answer. The military's requirement for a large conscript army at a time of very slow labor force growth affects economic output trends negatively. However, there is not likely to be a significant increase in Soviet military manpower during the next few years, assuming no major conflicts arise. The impact of a virtually constant standing army on the roughly 15 million workers in machine building and metalworking is small when examining short-term resource allocation alternatives. The longer-term impact of adding or subtracting substantial numbers of workers to or from the machinery sector would be significant in altering output levels.

The major impact of military activities on machine building is the procurement of weaponry, which absorbs over a third of that sector's output. Allocation of machine-building output to the military directly reduces the amount of capital investment and consumer goods available to the economy and has contributed to the slowing of Soviet economic growth.

CONSUMERS OF MILITARY PRODUCTS

Question 16. The table on military production, table 44, of your prepared statement does not indicate how many of their weapons output is exported to Moscow's allies, how many go to their own troops, and how many are placed in reverse or storage. What are the facts?

Answer. Over 75 percent of the tanks, other armored vehicles, and multiple rocket launchers recently produced have been for Soviet forces because many of these weapon systems are relatively new. A smaller percentage, about half, of self-propelled and towed field artillery, is for domestic use, and nearly all antiaircraft guns are for export.

The trend in export of Soviet naval ships in recent years shows approximately 10 percent of submarines and major surface combatants being transferred to other countries. The submarines exported have all been conventionally-powered, and the major surface units have been the smaller, less sophisticated models.

In the same time frame the Soviets have exported about 60 percent of the minor combatants produced. Of the auxiliary ships acquired by the Soviet Navy, over 60 percent have been imported.

The vast majority of missiles are produced for Soviet use. Certain strategic categories (ICBMs, IRBMs, and SLBMs) are not exported at all. Significant quantities of defensive missiles (SAMs and ATGMs) are exported. These frequently are the man-portable systems or the older, less sophisticated, systems. While precise data is not available, exports probably account for less than 25 percent of yearly production.

In the aircraft category, fighters/fighter-bombers and helicopters are exported in significant quantities. About 35 percent of fighters and 25 percent of helicopters produced are exported. Transport exports account for 15 percent of output. No bomber or ASW aircraft are exported.

COUNTERING THE MX AND B-1 BOMBER

Question 17. Discuss the Soviet capability for countering the MX and a new B-1 bomber.

Answer. The Soviets could counter the MX by fractionation of their Intercontinental Ballistic Missiles (ICBMs). They could increase the number of RVs on the SS-18 MOD 4 from the present level of 10 RVs, and on the SS-19 MOD 3 from the present level of 6 RVs.

The Soviet have not yet created a solution to the problem of intercepting the B-1 bomber. However, a number of systems nearing initial operating capability, if deployed, will significantly improve their B-1 intercept ability. A modified FOXBAT is under development with a look-down/shoot-down capability and is expected to be deployed to counter the low-level penetrating bomber.

The Soviets are also developing a new airborne warning and control system to detect low-altitude intruders. This system will have improved radar and early warning capabilities and will provide not only low, but all-altitude surveillance. It is expected to be deployed before 1985.

The B-1 bomber will encounter essentially the same threat from Soviet Surface-to-Air Missiles (SAMs) as current U.S. bombers do today.

The Soviet SAM force has inherent problems in countering bombers penetrating at low altitudes and have no effective SAM defense against stand-off aircraft armed with cruise missiles or SRAM. The newly deployed SA-10, while offering some improvements in target engagement at all altitudes, is not expected to solve these problems.

We expect that the currently deployed SAM systems, the SA-2, SA-3, SA-5 and SA-10, will continue to be the mainstay of Soviet SAM defense through the remainder of the decade.

The Soviet Antiballistic Missiles (ABMs) are deployed only to defend Moscow. The Moscow system employes the ABM-1B GALOSH interceptor missiles which are located at four complexes near the city. The system also includes early warning radars located on the periphery of the Soviet land mass and two battle management radars in the Moscow complex.

The 1972 ABM treaty, among other restrictions, limits each side to defending one location with up to 100 missile launchers. Thus far, they have abided by this proviso. While we anticipate upgrading of the Moscow system it is not anticipated that they will change the location of the their ABM defenses while the treaty is in force.

The Soviets continue however, to engage in an active and costly ABM research and development effort, as both sides are permitted to do under the ABM Treaty of 1972. The main concentration appears to be on improving the performance of their large phased-array detection and tracking radars, and on developing a rapidly deployable ABM system which includes a new interceptor. Although the Soviets may be investigating the application of high-energy lasers, and even charged particle beams, to ABM defenses, severe technical obstacles remain in the way of converting this technology into a weapon system that would have any practical capability against ballistic missiles. We still have no evidence, moreover, that the Soviets have devised a way, even conceptually, to eliminate these obstacles.

PUBLIC SUPORT ON AFGHANISTAN

Question 18. Last year you said the Soviet public supported the Soviet invasion of Afghanistan. Do they still support it?

Answer. Soviet public support of the invasion of Afghanistan is difficult to judge as it is Moscow's policy to minimize public awareness of problems resulting from the invasion. There is little information in the media on the subject, and that which does appear presents Soviet activities in a favorable light. The populace at present seems to accept the invasion and continues to be somewhat surprised that the occupation of Afghanistan remains such a discordant element in Soviet relations with certain countries, particularly the United States.

SOVIET FORCES ON THE CHINESE BORDER

Question 19. What portion of Soviet forces are deployed on the border with China or earmarked for a Chinese contingency and what is the breakdown of these forces in terms of number of troops and equipment such as tanks, aircraft, and missiles?

Answer. Approximately 25 percent of the active, peacetime Soviet general purpose ground forces are deployed along the Sino-Soviet border, or are earmarked for operations against China. This force includes 25 percent of the active divisions and 23 percent of overall peacetime personnel strength. The equipment associated with this force includes the following percentages of equipment out of the total active inventory:

	Percent
Tanks	26
Armored personnel carriers	28
Artillery (over 100-mm)	25
Antitank artillery (over 70-mm)	32
Antitank guided missiles	30
Surface-to-air missiles (excluding man portable)	26
Antiaircraft artillery	25
Tactical surface-to-surface missiles	26
Ground force helicopters	25

Approximately 25 percent of Soviet tactical fixed-wing combat assets assigned to Frontal Aviation are located at airfields near the Sino-Soviet border. This force is composed almost entirely of modern aircraft in the fighter and ground attack categories. The reconnaissance assets are about 70 percent modernized with indications that the older aircraft will be replaced shortly. There are also indications that additional numbers of combat aircraft will be introduced into the region imminently.

TANK IMPROVEMENTS

Question 20. Does the Soviet's new T-80 tank represent a significant improvement over their existing tanks? If so, in what respects?

Answer. [Security deletion.]

T-80 ARMOR

Question 21. Does the T-80 incorporate chobham-type armor?

Answer. [Security deletion.]

SOVIET ANTITANK CAPABILITIES

Question 22. Discuss existing Soviet antitank capabilities with respect to the U.S. Army's M-1 tank.

Answer. [Security deletion.]

SOVIET READINESS STANDARDS

Question 24. In prior testimony, DIA described the readiness standards of Soviet forces. Describe Soviet readiness standards with respect to flying time of tactical aircraft, exercises by combat troops using tanks and other ground equipment, steaming time versus time at anchor of naval vessels, hours at sea versus hours at port of surface naval vessels, attack submarines and strategic submarines, and land based strategic missiles and strategic bombers.

Answer. Soviet tactical aircraft are maintained at nearly total readiness, and flight-time is sufficient to allow total readiness within hours, rather than days.

In general, the Soviet mobilization system emphasizes speed and efficiency to maximize the initial availability of forces to assure that any future ground war is not fought on Soviet territory. The maintenance of a large standing army in peacetime, the existence of a quick-reaction mobilization system, and a doctrine which emphasizes offensive operations are all designed to prevent a recurrence of the catastrophe which the Soviets suffered during the early years of World War II.

Relatively few Soviet divisions are manned at or near their wartime authorized strengths; most of these divisions are garrisoned in Eastern Europe or are airborne divisions located within Soviet territory. On the other hand, most motorized rifle and tank divisions in the interior of the Soviet Union, and along less sensitive border areas, are manned at reduced levels in peacetime. In fact, about 50 percent of all Soviet divisions are manned at less than half their wartime authorized strengths; these are called "cadre" divisions by the Soviets. Probably the most significant potential weakness of the Soviet reserve and mobilization system is the reliance on large numbers of reservists to "flesh out" these cadre divisions during an emergency. It should be emphasized that these divisions are not organized reserve units similar to those found in the US, that is, units which would be mobilized with the same reservists who regularly train with the unit in peacetime. Most Soviet reservists (especially enlisted men) do not know what unit they will be assigned to during wartime mobilization and have never trained with that unit. Under extreme circumstances (reaction to surprise attack) the Soviets might be willing to commit some of these freshly mobilized units directly into combat in a defensive mode. Under less extreme circumstances, however, the Soviets would prefer to make more deliberate time-phased preparations designed to increase the cohesiveness and effectiveness of these units prior to commitment into an offensive environment.

Unlike the US, the Soviet Navy, especially its submarine force, does not maintain a high percentage of units deployed. The deployed surface units seen primarily in the Mediterranean and Indian Ocean spend a good deal of their time either in designated anchorages or in friendly ports. For instance, those in the Mediterranean spend some 70 percent of their time in an anchorage or port. They often make excursions from these anchorages to participate in exercises and in reaction to western units. The deployed submarines, because of the covert nature of their operations, are seldom seen, and are active for the majority of their deployment. Diesel-powered submarines replenish and conduct upkeeps during their characteristically longer deployments, but are also very active and covert.

Naval forces remaining in fleet areas are quite active in local operations. Local operations, which include a much greater exercise expenditure of weapons (in particular torpedoes and missiles) than their western counterparts, keep these units in a good state of readiness. Certain submarine and combatant units at their home bases are probably on a high state of readiness. Readiness of selected units will increase just prior to fleet exercises.

Soviet ICBMs, like US ICBMs, are fully manned and on a normal readiness condition on a routine basis. Most, if not all, Soviet ICBMs could be launched within minutes of a valid launch order.

Soviet Air Force strategic bombers do not maintain an airborne alert or continuous ground alert (that is, with a reaction time of 15 minutes or less). Soviet Air Force bombers would assume higher stages of readiness during periods of international crisis.

IMPROVEMENTS IN SOVIET ANTITANK CAPABILITY

Question 23. Discuss likely improvements in Soviet antitank capabilities by 1985 with reference to the M1 tank in 1985.

Answer. [Security deletion.]

INFLATION AND ECONOMIC PERFORMANCE

Questions 25 and 26. Do you agree that to the extent that there is a lack of certainty about the rate of inflation in the Soviet Union, there must be a lack of certainty in our understanding of Soviet economic performance? Isn't it correct that if we are not sure of the actual inflation in the Soviet economy, we cannot be sure of their real rate of investment or of the real rate of economic growth?

Answer. Yes; the evaluation of real Soviet economic performance is directly dependent on understanding the trends in costs, prices, and productivity of the output of the Soviet economic system.

COMPARATIVE CONSUMER INFLATION

Question 27. Do you agree that as a result of government subsidies, the Soviet consumer has in general experienced less inflation in the past several years than have consumers in Western Europe or the United States?

Answer. Yes; the rate of inflation for consumer goods and services in the Soviet Union, with the exception of some specific commodities on the collective farm markets, has not approached the double-digit level that has appeared in some of the Western industrial democracies. Not all of the credit for avoiding inflation goes to subsidies, however. The Soviet price system reflects central decisions on price levels for most products, and the overall system is seldom revised upward. The real cost of avoiding overt inflation in this manner is the gross misallocation of resources, resulting in much lower levels of output of goods in high demand than a market price system would bring about.

ALLOCATION OF RESOURCES IN THE SOVIET UNION AND CHINA—1981

THURSDAY, OCTOBER 15, 1981

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON INTERNATIONAL TRADE, FINANCE,
AND SECURITY ECONOMICS OF THE
JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee met, pursuant to notice, in executive session, at 10 a.m., in room 1224, Dirksen Senate Office Building, Hon. William Proxmire (vice chairman of the subcommittee) presiding.

Present: Senator Proxmire.

Also present: Richard F. Kaufman, assistant director-general counsel.

OPENING STATEMENT OF SENATOR PROXMIRE, VICE CHAIRMAN

Senator PROXMIRE. The subcommittee will come to order. I am happy to welcome to the subcommittee, Henry Rowen, Director of the National Intelligence Council who will present this year's assessment of recent developments in the economy of the Soviet Union.

As you may know, the Joint Economic Committee has been examining the Soviet economy on a regular basis for about 25 years. This particular series of hearings are entitled "Allocation of Resources in the Soviet Union and China—1981." They began in 1974 and have been held every year since that time, and I think I've chaired the hearings consistently during this 8-year period.

The focus of our inquiry has shifted as conditions and interests have changed from year to year. Your testimony, Mr. Rowen, this year deals exclusively with the Soviet Union to the exclusion of China. I think this focus is appropriate in view of this administration's priorities.

Obviously our policies with respect to the Soviet Union have changed, and correctly or incorrectly there is a different approach being taken toward Moscow.

One consequence of this is the acceleration of our defense programs in response to the new perception of the Soviet threat. All the more reason why this subcommittee should concern itself with economic trends in the Soviet Union.

I think that the superintendent is overdoing this Wisconsin atmosphere a little bit, but I think it will improve as time goes on. I want you to know your reception is not as chilly as the temperature in this room.

Mr. Rowen, if you will introduce the other witnesses accompanying you, you may proceed with your statement as you wish and then we will have some questons.

STATEMENT OF HON. HENRY ROWEN, CHAIRMAN, NATIONAL INTELLIGENCE COUNCIL, ACCOMPANIED BY DOUGLAS DIAMOND, JAMES STEINER, GEOFFREY SCHLEIFER, AND CHARLES GRIFFITH, OFFICE OF SOVIET ANALYSIS; DAVID JACKSON, OFFICE OF GLOBAL INTELLIGENCE; AND KATHY YOUNG, OFFICE OF LEGISLATIVE COUNSEL

Mr. Rowen. Thank you, Mr. Vice Chairman. I have several people with me who are experts in various topics. With me at the table is Mr. Diamond, Office of Soviet Analysis.

Mr. Vice Chairman, I would like to lead off with a brief statement, then answer any questions you might have.

Senator Proximire. Go right ahead.

Incidentially, if you will abbreviate your statement, your entire prepared statement will be printed in full in the hearing record.

Mr. Rowen. Thank you.

I want to concentrate on four topics. The topics are basically: The overall state of the Soviet economy, agriculture, energy, foreign payments situation, and its defense sector.

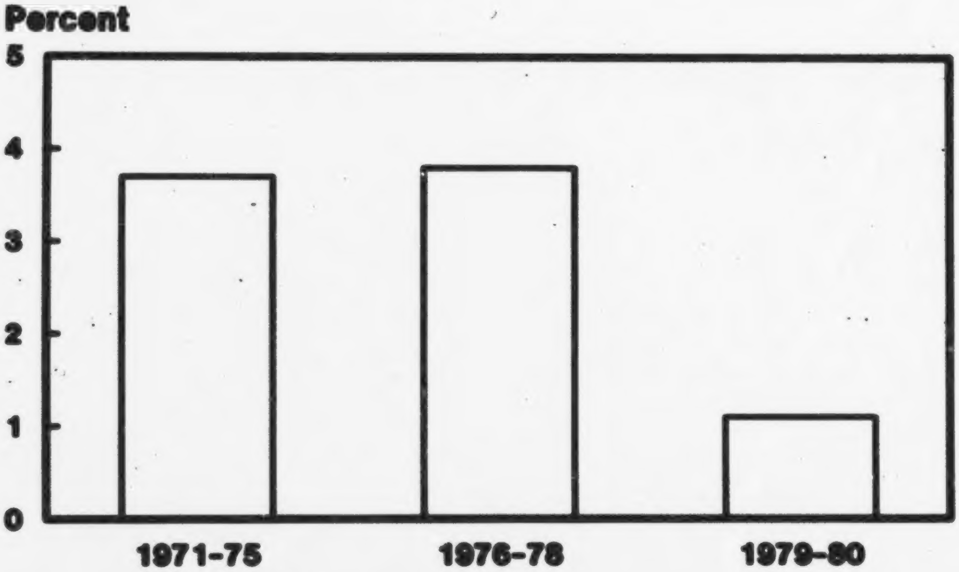
The overall state of the economy can be summarized very briefly. It is an economy in a good deal of difficulty. It is turning very sour indeed, and this even before the major problems of labor and energy shortages become acute.

Chart 1 shows what has happened to the real rate of growth, GNP growth over the last decade in the Soviet Union. There is quite a marked decline since 1978.

[Chart 1 follows:]

CHART 1

USSR: Average Annual Rate of GNP Growth 1971-80



Senator PROXMIRE. That is interesting, to put it in perspective, I think our rate of growth would be rather similar.

Mr. ROWEN. Actually over the period 1979–81 growth was slightly higher for the United States.

This year, only a fairly weak rebound is expected, less than 2 percent growth for 1981. In part this is because agriculture is having another bad year, the third in row. This year's grain crop is expected to be no more than 170 million tons, but the Soviet Union will be importing a great deal of grain, which means that meat production will not fall.

Industrial growth is slowing. Output growing only at 2 percent in the first half of 1981 compared with the year earlier, which was the second worst showing in the postwar period. So there is a very serious economic problem that the Soviet leadership faces.

Planned investment, during the 11th 5-year plan (1981–85) will not be enough to sustain high rates of growth, especially given the slump in productivity growth.

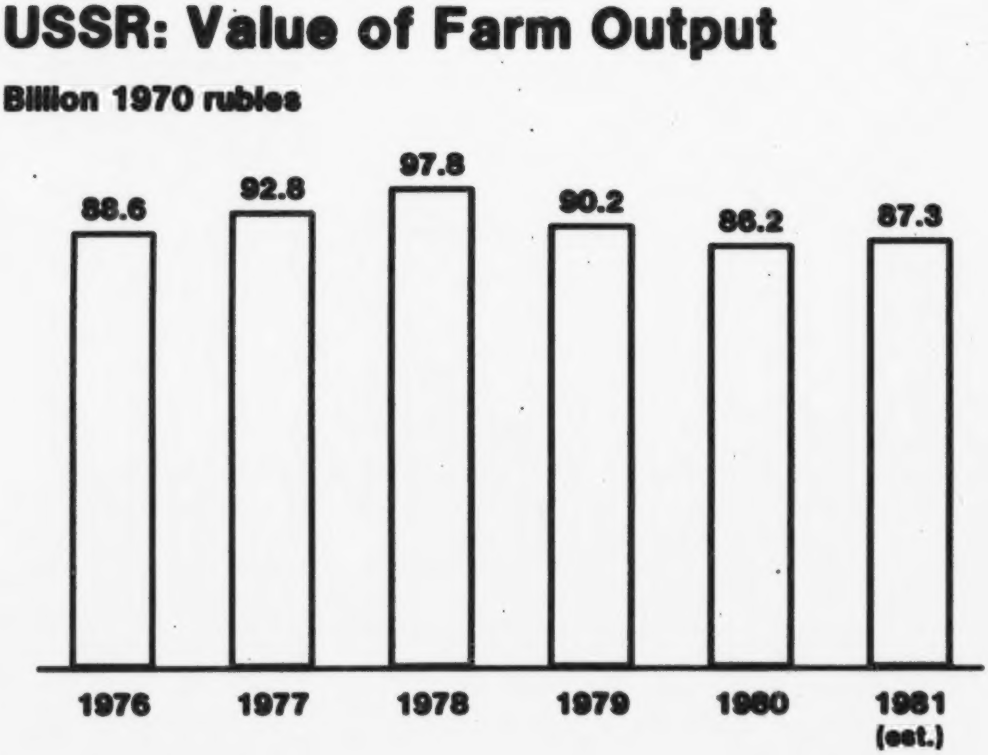
Several critical sectors, such as energy, transportation, and agriculture are going to need a good deal more investment. But the planned overall increase in investment of 1.6 percent a year is very modest, indeed. That's less than the 3½ percent a year achieved in the last 5-year period of 1976 through 1980.

Our own U.S. defense spending plans have probably led the Soviet military to ask for more money, and then there's the cost of supporting the position of the Soviet Union in Eastern Europe, especially Poland, where the costs, quite evidently, are high, and the leadership is realizing this now, presumably.

I want to turn now to these four areas: agriculture, and energy, foreign trade, and defense sector. First, the chart on agriculture.

[Chart 2 follows:]

CHART 2



USSR: Value of Farm Output

Billion 1970 rubles

Farm output in 1981 was roughly the same as in 1980, and it was below the 1976 level.

Actually, it was projected to grow a good deal over this period, so the shortfall is really quite serious. The Soviets had been hoping for a change in the weather, and have been relying on massive food imports to get along. The net imports of farm products nearly doubled between 1978 and 1980.

Senator Proxmire. May I ask, with more or less static farm output, how about the population—No. 1, the population of the Soviet Union as a whole during that period? And No. 2, the number of people on farms.

Mr. Rowen. Perhaps Mr. Diamond could answer.

Mr. Diamond. Since 1975, the population has risen about 13½ million in total, and the rural population, is currently about 98 million people.

There has been slowing of the outmigration from agriculture.

Senator Proxmire. So this indicates there has been no significant increase in farm output during the 6-year period?

Mr. Diamond. That's right. It's flattened out.

Senator **Proxmire**. The other question is: This is in rubles? Does that reflect accurately the physical production? Is the price level fairly stable? Or is the ruble distorted?

Mr. **Diamond**. These figures are expressed in constant rubles.

Senator **Proxmire**. Oh, constant rubles.

Mr. **Diamond**. These are constant 1970 rubles.

Senator **Proxmire**. OK.

Mr. **Diamond**. In current rubles, it would be going up, because they keep raising purchase prices to collective and state farms to try to induce them to boost output over time.

Senator **Proxmire**. This does reflect, then, the actual physical production.

Mr. **Diamond**. That's right, sir.

Senator **Proxmire**. Very good.

Mr. **Rowen**. The leadership has not increased its share of investment going to the sector since the mid-1970's, and the current 5-year plan suggests no change in the strategy in the next 5-year period.

This attitude in the leadership, which is one of hoping things will get better, also apparently reflects the judgment that widespread popular unrest is unlikely. They have increased special distribution systems so that elite groups and factory workers get the first crack at food supplies. This, of course, implies that there is less for others.

For the nonelite groups, supplies of quality foods are off. Black market activities, the second economy, reduces some of the pressure by assuring that those that have the funds and access can get something extra. However, the leadership may be too complacent in its attitudes because even with continuing large imports of farm products and return to average harvest, only a small increase in per capita consumption is likely.

Labor productivity is likely to suffer with continued shortages. There are several social indicators, indicators of health, that certainly suggest that the Soviet society is in trouble. Alcoholism will probably continue to increase. There is this rise in mortality rates, in part probably because of the heavy drinking.

And getting the hard currency to support massive imports of food and other consumer goods will be far more difficult in the 1980's.

DRUG PROBLEM

Senator **Proxmire**. Do they have a drug problem like ours, or not?

Mr. **Rowen**. I think probably less of a drug problem in some ways.

But again, I would turn to an expert.

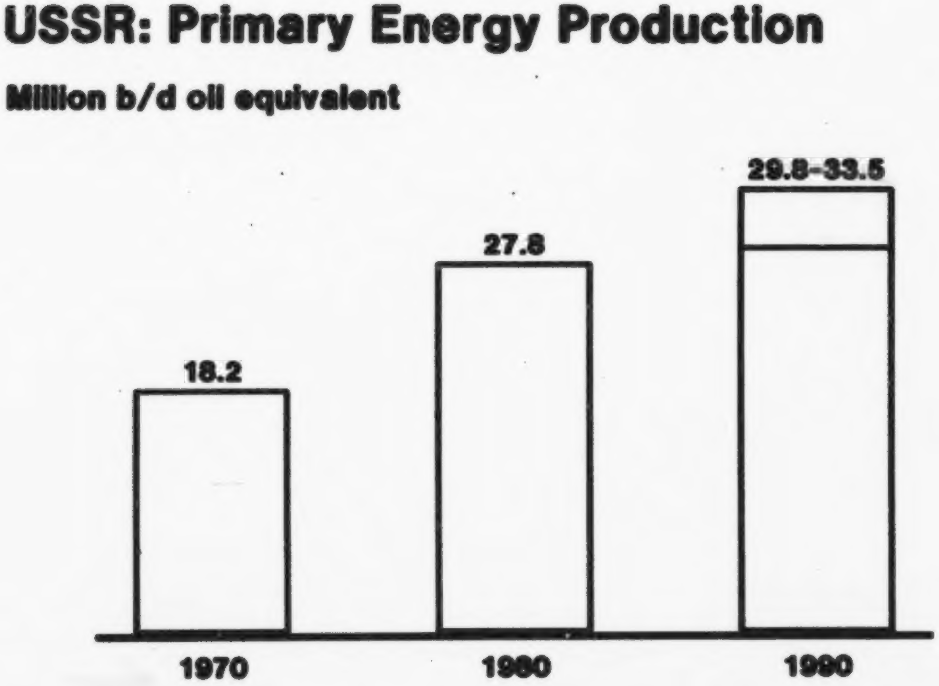
Mr. **Diamond**. Very minor, from all anecdotal information we have. [Security deletion.] It doesn't seem to be of official concern or certainly not the level of drug usage of, say, in Western Europe.

Senator **Proxmire**. Thank you.

Mr. **Rowen**. Let me turn now to energy, also a problem sector which is becoming more difficult.

[Chart 3 follows:]

CHART 3



Here is a summary projection of Soviet energy growth expressed in millions of barrels a day of oil equivalent. As you can see, growing very sharply from 1970 to 1980, and then growing less sharply to 1990, up to the order of 30 million barrels a day equivalent by 1990. This is about 2 percent a year growth projected in the 1980's, compared with the 4½-percent growth of the 1970's.

Oil is the principal problem. As I am sure you will recall, the CIA in 1977 forecast a downturn in Soviet oil production, and the sense of that still appears valid.

The Soviet plans call for production to grow at 1 percent a year through 1985. These do not seem feasible. [Security deletion.] That is still a probable decline from present level, and the projected Soviet level, for that year.

We expect a further decline in the second half of the decade. The basic problem is that they are depleting their high quality reserves more rapidly that they are finding new ones.

Most serious is the decline in quality of the reserves. New production is coming from smaller fields, less productive strata, so they need to do a good deal more drilling per unit of oil that is produced.

And this increase in the amount of drilling required is so sharp that it appears that they will not be able to keep up with the rate of depletion of the existing fields, existing reserves.

Western equipment could help, and that explains some of the range of uncertainty but short-term success in holding production high would also steepen the decline, when it comes.

They have other energy problems as well. Coal is certainly a problem fuel for them. Coal output has declined from a high of 724 million metric tons in 1978 to probably around 710 million metric tons this year. And it's not a problem of reserves; it's a problem of reserves in the right locations in the country, and production.

Output will probably be no higher than 740 million metric tons by 1985, which is far short of the 770 to 800 metric million tons of the target.

Gas is the one major fuel in which the supply is elastic in the Soviet Union, after nuclear, which I will come to in a moment. By 1985, gas production of 10 million barrels a day in oil equivalent is expected, about one-third more than current. That's really quite an increase, and it continues at a rapid rate of development.

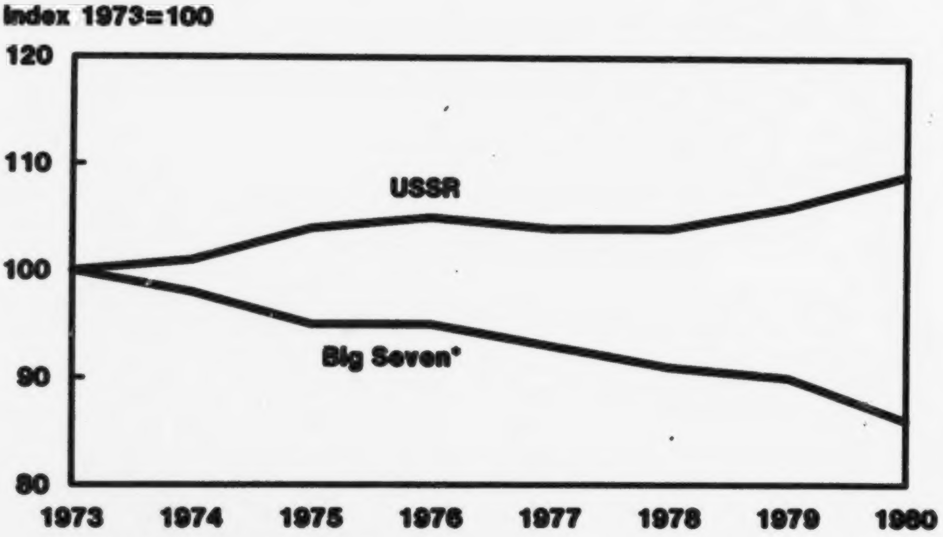
The resources required to develop this resource are quite large. They have to build six major trunk lines, each one of the order of magnitude or larger than the Alaskan oil pipeline. In today's dollar, just to get a benchmark figure, it would take about $10 billion to build an Alaskan pipeline, so we are talking about six of these over the next 5-year period.

One of the most interesting observations to make about Soviet energy is suggested in chart 4.

[Chart 4 follows:]

CHART 4

Energy/GNP Ratios



* The Big Seven includes the US, Canada, West Germany, France, Great Britain, Italy, and Japan.

It compares the energy-GNP ratio of the Soviet Union as against the major industrialized countries' trends over time. the Soviet Union is the only major industrialized country that has not economized in its use of energy since the world price of oil went up in 1973.

You can see how it's grown by about 10 percent per unit of economic output, whereas in the Westen industrialized countries, the decline has been of the order of 15 percent per unit of output. As you know, it is still declining. The West is getting more and more efficient in the use of energy and the Soviet Union appears to be on a trend in which it's getting less and less efficient.

And the gap between these two economic systems, as shown on the right-hand side of the graph, is really enormous.

Senator **Proxmire**. Of course, one reason, I take it, I guess, is because the Soviet Union does not import oil and we do; is that right?

Mr. **Rowen**. I think that has nothing to do with it. It's not just the United States; it's Japan, Canada, West Germany, France, Great Britain, and so on. It's really a collection of Western industrialized countries that are very different in their oil-importing propensity.

Senator **Proxmire**. But overall, in the aggregate, the Big Seven do import a substantial proportion of their oil. Right? This country imports what, 45 percent. The Soviet Union imports nothing; is that correct?

Mr. **Rowen**. That's right.

But if one took Canada, for example, which is very close, probably, in that regard, to the Soviet Union——

Senator **Proxmire**. But they're not broken out here.

Mr. **Rowen**. Not separately. But Canadian efficiency has improved, despite price controls, which has not helped to improve their efficiency.

Senator **Proxmire**. Isn't it true the Canadian economy is enormously influenced by our policies, because they're so close, so interrelated in every way?

Mr. **Rowen**. Certainly. They are tied very much to ours.

I think it has really very much more to do with the use of the price mechanism in the Big Seven and the nonuse of the price mechanism in the Soviet Union.

ENERGY EFFICIENCY

Mr. **Diamond**. There is another perspective on that chart. If the Soviet Union had followed the Big Seven trend in the energy-GNP ratio, in 1980 they could have saved a quantity of energy equivalent to $60 billion in current world market prices. This reflects the difference between the increase in energy use per unit of GNP of 10 percent between 1973 and 1980 compared to reduction of 15 percent of the Big Seven.

Senator **Proxmire**. How does their per capita consumption compare to our per capita consumption?

Mr. **Diamond**. It's about three-fifths of ours.

Senator **Proxmire**. Similar to the per capita consumption of European countries?

Mr. **Diamond**. Surprisingly, the Soviet per capita consumption of energy is roughly 40 percent above the per capita level in Europe.

Senator **Proxmire**. About the same? I see.

But whereas Western industrial societies are improving, that is, they are gaining in efficiency, the Soviet Union is becoming less efficient? You say the reason is because we have a pricing mechanism that imposes discipline, and they don't have that?

Mr. **Rowen**. Exactly. In fact, for the most part the use of energy is not even metered. The use is not even measured. So how can there be an incentive to economize, if the system doesn't know how much fuel it's really using at the point of use.

That's another graphic example.

Senator **Proxmire**. Even in their industrial use, they don't meter it?

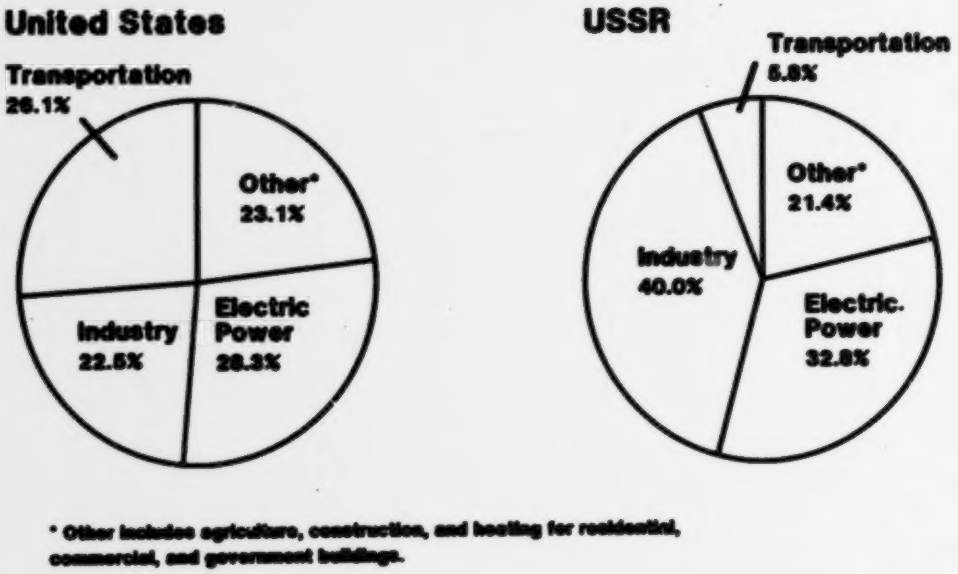
Mr. **Diamond**. They don't meter consumption in the household sector, the one sector that does pay attention to prices in the Soviet Union. Neither electricity or gas are metered, in general. Even if the introduced widespread metering in the industrial sector, the typical plant manager has little incentive to pay attention to costs.

Mr. **Rowen**. There is, of course, between the Big Seven and the Soviet Union, a marked difference in the distribution of energy. That is the types of uses as shown in chart 5.

[Chart 5 follows:]

CHART 5

United States and USSR:
Gross Energy Consumption, 1975



* Other includes agriculture, construction, and heating for residential, commercial, and government buildings.

As you see in the West, transportation looms quite large, and industry proportionately very much less than in the Soviet Union.

The Soviet Union is finding it exceptionally difficult to economize in these major sectors.

In principle they have the possibilities for conservation and for shifting the pattern of energy use, but the evidence in the record so far, as shown in the previous graphic, is that they seem to have been incapable of doing it, and there is no reason to believe in the next decade that they are going to get any better. It will take a long time.

Let me turn now to their hard currency problem. Because of a strong hard currency position during the last 2 years, largely caused by a favorable shift in the terms of trade, Moscow has been able to turn to its foreign sector for relief from its domestic problems. Total hard currency earnings largely from energy, gold and arms sales reached $30 billion in 1980. These earnings helped to finance: (a) The agricultural imports needed to prevent a deterioration of the Soviet diet, (b) importation of steel to offset domestic production shortcomings, and (c) purchases of equipment and steel pipe which allowed a stepup in investment in exploitation of critical energy resources.

However, this favorable period may be at an end, and this year Moscow's trade position has turned worse. Its trade deficit in 1981 could double to between $5 and $6 billion as another poor harvest pushes up agricultural imports, and softening demand for energy and other raw materials in the West is cutting earnings from dollar sales.

Their experience in hard currency earnings is shown in table 1. Their imports which you can see were running around $14 to $16 billion in the period 1976–78 shot up in the 1979–81 period.

[Table 1 follows:]

TABLE 1

USSR: Hard Currency Imports*

	1976	1977	1978	1979	1980	1981**
Total Hard Currency Imports (billion US $)	14.8	13.7	16.6	21.2	26.2	29–30
Agricutural Imports (billion US $)	4.1	3.2	3.8	5.5	8.8	12.5
Agriculture's Share of the Total (percent)	27.7	23.4	22.9	25.9	33.6	41.7–43.1

*Current prices

** Estimated

Of course agricultural imports was a major part of this increase and the share of agricultural imports has gone up quite considerably.

Part of their ability to finance these hard currency imports was obviously affected by the sharp increase in the price of oil beginning in 1979 as the collapse of Iranian production helped to drive up the world price to the Soviet's benefit.

This year, Moscow's total food bill will reach almost $12 billion, or over 40 percent of Moscow's hard currency imports. Despite the developments in the trade account, we expect Moscow to close out 1981 with a current account surplus, although much smaller than 1980.

Earnings from services, arms exports and gold sales should more than offset the $5 billion trade deficit and the higher import payments on the foreign debt. However, if the trade trend evidenced in the last several years continues, they could find themselves in a hard currency bind within a few years.

Their export picture is not bright. Oil export earnings will be squeezed by stagnant or falling production, rising domestic consumption, and probably a weaker world price of oil.

The Siberian gas pipeline to Western Europe, the only potential large earner of foreign exchange, will not be fully operational until 1986 or 1987 at the earliest. Some potential may exist for increasing arms sales. Last year they booked $14 billion in new military contracts.

But, their export picture generally is not bright for other products.

Thus, in the near term, Moscow will have to rely more on gold sales and on borrowing from Western banks, if it is to avoid the task of cutting imports of agricultural products and of capital goods.

POTENTIAL EFFECTS OF U.S. GOLD STANDARD

Senator **Proxmire**. Have you made any analysis of what effect the adoption of a gold standard by this country might have on the Soviets?

Mr. **Diamond**. No, we haven't, Senator. For the record we will respond on that.

Senator **Proxmire**. We would appreciate that very much. As you know, there is a Commission meeting on that in the Banking Committee, of which I am the senior member, the Senate Banking Committee. We will have a lot of responsibility in that area. I think it will be very helpful to have your thoughts about it.

Mr. **Diamond**. Yes; we will provide that answer.

[The following information was subsequently supplied for the record:]

A Strict Gold Standard and Potential Destabilizing Factors

The prime requisite for a gold standard is that the central bank or treasury buy or sell unlimited amounts of gold at fixed prices. Moreover, the buying and selling price must be practically the same, and imports and exports of gold bullion or coins must be permitted. A gold standard can be operated in a number of ways. Under a gold coin standard, gold coins circulate freely and can be bought or sold at the central bank or treasury. Another alternative, in which gold bullion is not used as money, is for the treasury or central bank to buy or sell bullion at fixed prices.

In theory, under a strict gold standard, inflows/outflows of gold to/from the central bank lead to an automatic expansion/contraction in certain categories of central bank liabilities, such as currency and deposits at the central bank. Changes in these central bank liabilities produce corresponding changes in the money stock.

With a strict gold standard, certain central bank liabilities [1] can be either fully backed by gold or backed at a fixed fraction. In the latter case, a $1 change in central bank gold holdings will cause a multiple change in central bank liabilities, which in turn causes a multiple dollar change in the money stock. For example, given the 1980 average money multiplier in the United States for M1-B—2.5—and a fractional gold standard of $1 of gold for every $2 in currency and deposits held at the central bank, an inflow of $1 worth of gold would lead to an increase of $5 in M1-B.[2]

Under a more flexible gold standard, the central bank can offset inflows and outflows of gold to some extent. If the purpose of a gold standard is to restrict central bank activity, any flexibility granted to the sectral bank tends to undermine the credibility of the gold standard.

When gold was sold at a fixed price during the era of the gold standard, gold production tended to increase whenever deflation occurred, since deflation lowered production costs and made the mining of gold more profitable in the country on a gold standard. The subsequent increase in production raised the money supply, which tended to halt or slow the deflation. In time of inflation the process worked in reverse, ultimately causing inflation to subside.

An impediment to a present-day gold standard is the loss in the downward flexibility of prices and wages. Any reduction in the growth of aggregate demand, caused by a stagnant or declining monetary gold stock, would lead to a reduction in economic growth rather than to deflation. In addition, about 75 percent of gold production today is controlled by the Governments of South Africa and the Soviet Union, which produce or sell gold according to considerations other than the short-term profit motive and thus impede the automatic self-adjustment that was inherent in the gold-standard era.

The likelihood that the Soviet Union would intentionally try to disrupt a gold standard seems minimal. The USSR's gold sales fluctuate in proportion to its need for hard currency and the alternative cost of external borrowing. Even if the Soviets decided to withhold gold from the market, there would be little effect of the operation of a gold standard. Recent Soviet gold sales have been relatively small compared to the total supply of gold coming into the market. On the other hand, the USSR is unlikely to sell off its entire gold stock in exchange for foreign currency, since Moscow has been particularly wary of foreign-currency depreciation. If the Soviets decided to sell their gold holdings, however, a central bank could temporarily disobey the rules and offset any undesired increases in the money stock by open-market sales of government securities with little, if any, loss of credibility in the gold standard. Unlike the case where the proportion of gold that backs central bank liabilities is reduced an increase in the proportion would probably not result in a loss of confidence in a gold standard.

A strict gold standard would be susceptible to large private speculative gold purchases and shifts in demand for gold by official and private institutions. If investors believed that the gold ceiling price set by the central bank could not be maintained, there would be a sudden surge in the demand for gold. The outflow of monetary gold would call for a reduction in central bank liabilities, resulting in a rise in interest rates and a contraction of the money stock until the gold flow reversed direction.

A relatively small amount of net gold purchases from the monetary stock could substantially affect the money stock and national output if the gold outflow could not easily be reversed. For example, if a gold standard in the United States required that Federal Reserve notes and deposits at the central bank be backed by gold and if the price of gold were set at $450 an ounce, the present U.S. gold stock would be sufficient to back every dollar of the Federal Reserve liabilities with approximately 78 cents worth of gold at June 1981 levels. If this ratio was maintained, a $1 billion gold purchase from the monetary stock would call for a $1.3 billion reduction in central bank liabilities and an approximately $3.2 billion drop in M1-B (0.75 percent), given the average money multiplier for 1980.

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[1] The liabilities subject to gold backing can differ. For example, gold could back only currency issued or it could back all central bank liabilities.

[2] A $1 increase in the monetary stock of gold results in a $2 increase in central bank liabilities. With a money multiplier of 2.5, $2 × 2.5 = $5.

Mr. **Rowen**. Let me turn to the fourth sector to be discussed, the defense sector.

The key question on defense is whether or not we will see more rapid growth in defense spending to match new U.S. programs, or will it continue to grow at a historic rate of 4 to 5 percent. Or, will the growth in this sector slow down during the course of the 1980's.

Current evidence points to the Soviet defense sector continuing to grow at its historic rate of 4 to 5 percent. The evidence here includes weapons, production and testing underway as well as programs currently on the drawing board.

This, of course, given the economic scene that is portrayed, means an increasingly high cost to the rest of the economy of the large and continued defense programs. By the mid-1980's this implies a slowing in annual increases in per capita consumption, in all likelihood, for its citizens. If the Soviets opted to reduce the growth of their defense budget, some bottlenecks might be eased, but their basic economic problems would remain.

Table 2 shows for several industry sectors, the kinds of related civilian lines that they have, and colse related production technologies. You can see for high technology types of weapons, [security deletion] missiles and aircraft and so on, the types of civilian lines that are related in some way in character to the weapons.

[Security deletion.]

[Table 2 follows:]

Table 2

RELATIONSHIPS BETWEEN DEFENSE AND CIVILIAN INDUSTRIES

MILITARY PRODUCTION	RELATED CIVILIAN PRODUCTION
Missiles and Aircraft	Civilian Aircraft
Naval Surface Ships	Pumps, machine tools, mining equipment
Submarines	Pumps, machine tools, mining equipment, large diameter pipe
Tanks	Construction and transportation equipment
Other Armored Vehicles	Construction, agricultural and transportation equipment
Artillery	Construction, agricultural and transportation equipment; and machine tools

For many of these defense industry categories, there are quite close civilian products, which could be expanded if the military would be cut back.

But such a shift would be opposed by powerful defense interests and would carry political risks as perceived by the leadership

We have to recognize also that given the tremendous size of military procurement—more than one and a half times the size of ours in recent years—even freezing the growth rate would have little impact on any existing stocks of Soviet weapons.

Senator PROXMIRE. Thank you, Mr. Rowen.

[The prepared statement of Mr. Rowen follows:]

PREPARED STATEMENT OF HON. HENRY ROWEN

GENERAL

I. Mr. Chairman, when CIA representatives have addressed your committee in the past several years, they have discussed in detail the fundamental change in store for the Soviet economy in the 1980s. They have testified that because of impending labor and energy shortages, rising raw material costs, planning errors, and sluggish productivity growth, the 1980s would be a period of substantially reduced growth.

  A. Our basic message has not changed, Mr. Chairman. This morning, however, we would like to draw your attention to some recent developments in the Soviet economy that pose some difficult near-term policy choices for the USSR's leadership.

  B. As the Soviet Union completes the first year of its new five-year plan, the economy has turned sour before the much-discussed labor and energy problems have become acute.

    1. Agriculture, of course, has had three consecutive poor years.

2. But several industrial sectors have also performed badly during this period. In industry, productivity trends have been especially disappointing since 1975.

C. The shortfalls in the economy have advanced the time in which the leadership has to deal with an economic crunch.

1. We think, for example, that planned investment will not be enough to sustain growth in view of the productivity record of the past few years. Planned investment growth during 1981-85 is to average only 1.6 percent per year, less than the average annual growth of 3.5 percent achieved during 1976-80.
2. Several critical sectors such as energy, transportation, agriculture, machine building, and construction materials are vying for investment resources.
3. US defense spending plans have probably led the Soviet military to ask for more money even though present Soviet spending levels are already a heavy burden.
4. The Soviet consumer, meanwhile, no longer can count on the steady and marked improvement in living standards characteristic of the 1960s and early 1970s.

   5. Finally, the chaos in Poland has shown Moscow how expensive maintenance of Soviet power in Eastern Europe might become.

D. For a group of Soviet leaders in their last years of power, decisions on how to deal with a fairly sudden slowdown in economic growth have been hard to come by.

   1. This morning, Mr. Chairman, after first reviewing the current performance of the Soviet economy, we would like to discuss four aspects of Soviet policy that are both critical to the economic vitality of the USSR and of great importance to East-West relations.
   2. We will consider recent developments in agriculture and energy, emphasizing the policies that the leadership has adopted to handle emerging problems.
   3. We will then review Soviet use of foreign trade as a means of softening the impact of domestic difficulties.
   4. In concluding our presentation, we will try to assess the possibility that the leadership might modify Soviet military programs in response to changes in US defense programs or to give more resources to sectors of the economy that are in trouble.

CURRENT PERFORMANCE

II. 1979 and 1980 were bad years for the Soviet economy.

   A. Although we have long foreseen a slowdown in economic growth, the economy's performance during the past two years was worse than we anticipated.

      1. Shortfalls in industrial production and back-to-back harvest failures reduced GNP growth to its lowest level since World War II.

      2. Figure 1 shows that after averaging close to 4 percent during most of the 1970s, the average annual rate of GNP growth fell to just 1 percent during 1979-80, led by a 10 percent drop in farm output. (See Figure 1)

   B. Moreover, the economy shows few signs of rebounding this year. We now believe the Soviets have had their third straight harvest failure.

      1. Our current estimate is for a grain crop of no more than 170 million tons, at least 19 million tons less than last year's poor harvest.

      2. Output of most nongrain crops--while generally above last year's terrible

performance--is also unlikely to exceed the average of the past five years.

3. Although overall Soviet farm production is expected to increase slightly from last year's extremely depressed level, Figure 2 shows that output will still be below the 1976 level. (See Figure 2)

C. Industry, the backbone of the Soviet economy, is also doing poorly. More than halfway through 1981, growth in almost every major sector is running behind the pace of a year ago.

1. Industrial output grew only 2 percent in first-half 1981 compared with first-half 1980. In the post war period, only the 1979 first-half showing was worse.

2. Lagging output of industrial materials, especially ferrous metals, is a major reason for industry's malaise. Crude steel production showed almost no gain compared with a year ago, while civilian machinery output--the major source of investment goods and consumer durables--increased only 2.6 percent during first-half 1981, a post-war low.

D. Underlying industry's poor showing is the continuing slowdown in the growth of labor productivity. Productivity during the first six months grew at an annual rate of less than 1 1/2 percent--almost one-third less than in 1979-80 and far below the 4 1/2 percent average targeted for the 11th FYP.

1. One reason for the sharp fall in productivity growth is the rising cost of exploiting raw materials. The quality of mineral deposits has declined in many instances, and minerals, energy, and timber must be obtained from remote areas, notably Western Siberia.
2. At the same time, the failure to increase civilian machinery output more rapidly has limited Moscow's ability to introduce labor-saving technology.
3. Although difficult to measure, declining worker morale also seems to be taking its toll. Workers who have seen their hopes for a better life dashed in recent years simply have not responded to nominal increases in wages with harder work.
    a. One indication of the decline in consumer well-being has been a sharp rise in the mortality rate among the population.

   b. During the past decade, the crude death rate has increased by roughly 25 percent--an unprecedented occurrence in a developed country.

   c. Males ages 20-44 have been hit particularly hard--in large part because of the sharp rise in alcoholism among this group.

   d. As a result, the life expectancy among males has dropped to 63 years, placing the USSR in a peer group with LDCs in Latin American and Asia.

  4. Finally, shortages of basic materials, such as steel and cement, have become much more serious in recent years, creating bottlenecks throughout the economy and disrupting and, in some cases, halting construction activity and industrial operations.

E. Because these problems cannot be easily overcome, Moscow will find it very difficult to break out of its economic doldrums during the next several years.

  1. We now estimate GNP growth this year at less than 2.0 percent, a weak rebound given the harvest problems the past two years.

a. Net farm output which has declined for two consecutive years will rise little if at all as crops other than grain have suffered from poor weather conditions this year.

2. Even with a return to more normal harvests, we expect problems in industry and other sectors of the economy will cause GNP growth to fall to about 1.5-2 percent per year by the mid-1980s.

3. It should be stressed that these figures are just averages. In poor harvest years, GNP could actually decline, while in bumper crop years growth could be as high as 3-4 percent.

AGRICULTURE

III. Turning first to agriculture, the USSR in the 1980s is experiencing a marked slowdown in the growth of production at a time of steadily rising demand for farm products--a demand occasioned by growth of population, increased purchasing power, and heightened expectations of an improved diet.

A. Despite the depressed levels of annual farm output experienced since 1978, Soviet leaders have shown no inclination to increase what they view already as a very large share of resources devoted to the farm sector.

B. Instead, they have been temporizing; relying on record levels of imports of farm products to compensate for harvest shortfalls while hoping for the weather to turn in their favor.

  1. Net imports have nearly doubled since 1978 and are expected to rise by about 1/3 in 1981.
  2. Even so, the per-capita availability of agricultural commodities fell in 1979 and 1980 and is still not expected to reach the 1978 level this year. (See Figure 3)

C. While the odds are that the weather will be better next year, a return to the unusually favorable weather patterns that existed from the mid-60s to the mid-70s seems unlikely.

  1. Rather the somewhat harsher, conditions that prevailed for 20 years prior to the mid-60s are likely to return, that is, years of near average temperatures and moisture will be interspersed with years of above-average and below-average conditions.

D. In this environment, the steady gains in agricultural output that accrued between the mid-60s and mid-70s--largely the result of good weather--will be nearly impossible to achieve in the eighties unless there is a sharp reversal of current trends in the allocation of inputs to agriculture.

FIGURE 1

USSR: Average Annual Rate of GNP Growth 1971-80

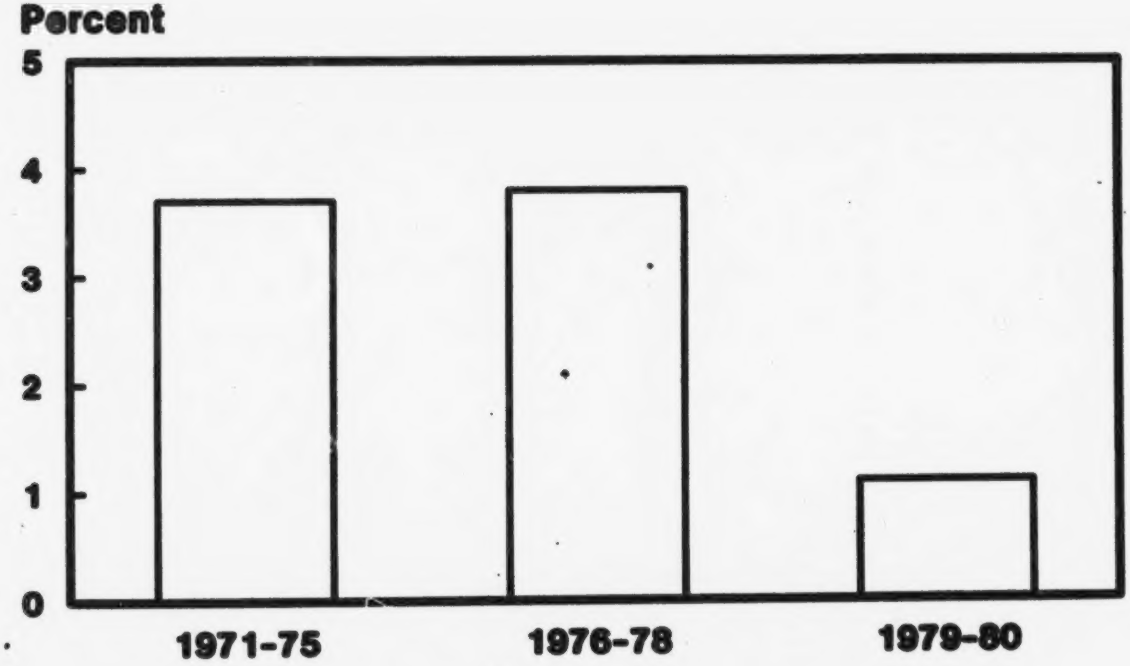
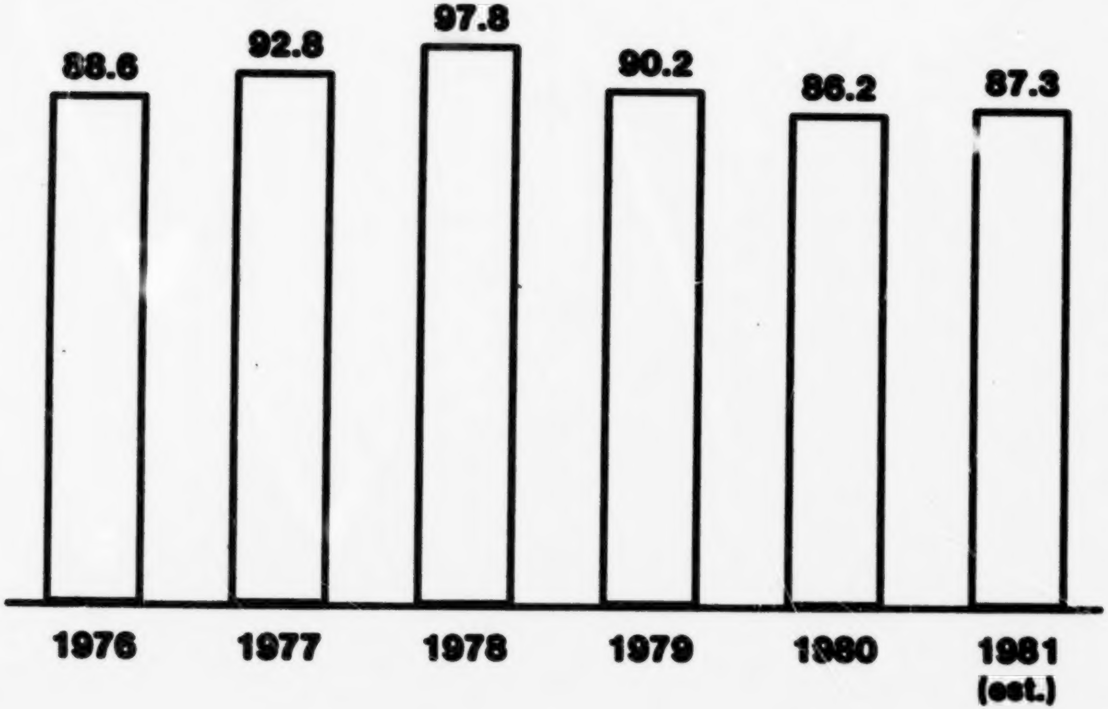


FIGURE 2



USSR: Value of Farm Output

Billion 1970 rubles

1. Even before 1979, progress in agriculture was declining due to slower growth in the resources devoted to the sector.
   a. The share of investment allocated to agriculture, for example, has not changed since 1975 despite a sharp fall-off in the growth of total investment.
   b. Annual deliveries of tractors and trucks to farms have remained at about the 1975 level during the past five years.
   c. The increase in the deliveries of mineral fertilizer during 1976-80--a major factor promoting higher yields--slowed substantially from earlier periods.
2. Moreover, Moscow's Plan for 1981-85 suggests little or no change in these trends.
   a. Increments to agricultural investments will continue to fall.
   b. Of the major industrial inputs, only growth in the deliveries of fertilizers are expected to exceed rates of recent years--and achieving this goal is dependent on bringing on-stream long overdue new productive capacities.

E. The phlegmatic attitude of Soviet leaders toward the farm sector reflects not only a belief that weather conditions will improve but also a perception that widespread popular unrest is unlikely.

  1. Dissatisfaction with food supplies, while vocal, does not appear to affect the most important requirements of the population.
  2. So far, Moscow has been able to limit the worst impact of food shortages to groups who have little or no political or economic leverage.
     a. Special distribution systems and rationing have ensured that elite groups and factory workers in favored industries have gotten first crack at available supplies.
     b. Black market activities also have expanded greatly, relieving the pressure somewhat for those with special access and the necessary funds.
  3. Soviet leaders probably are also counting on continuing increases in hard currency earnings to support large imports of grain and other foodstuffs that they judge will carry them over the lean years.

F. If these actions and expectations reflect considered Soviet judgments, they may be far too complacent.

1. As I've already mentioned, we think they are overly-optimistic about future weather patterns.
2. Even if grain production were to return to trend (i.e., harvests on the order of 215 million tons in 1982 and 230 million tons in 1985), continued large imports of grain would be required even to boost per capita meat consumption slightly (1-2 percent annually).
3. In a population where per capita meat consumption is a key indicator of well-being, consumption gains on this scale are likely to be imperceptible, particularly when compared with the gains posted during the late 1960s and early 1970s.
4. More important, over half the USSR's population has grown up in an atmosphere of steadily rising real incomes, and, thus living standards. A failure to restore this upward trend would be a bitter disappointment and could generate a different response than Soviet leaders currently anticipate.

5. Finally, acquiring the hard currency to support massive imports of food and other consumer goods will be far more difficult in the eighties than it was in the seventies because of a loss in the major source of hard currency earnings, a development that I will turn to shortly.

ENERGY

IV. Agriculture is not the only sector that promises to be a drag on the the Soviet economy in the 1980s. Rising costs of energy production are forcing the Soviets to increase the fraction of total investment allocated to this sector, at the same time that growth in output is slowing significantly.

A. During 1971-80, energy output increased by 10 million barrels/day (b/d) of oil equivalent or roughly 4.5 percent per year.

1. During the next decade, however, we believe the Soviets will be lucky to achieve half that rate, with growth probably averaging about 2 percent annually. (See Figure 4.)

2. Oil production--stagnant at about 12.1 million b/d for the last year--is the major stumbling block slowing total energy growth. Our forecast in 1977, that Soviet oil production would peak no later than the

early 1980s and then go into decline, remains essentially valid. Four years later, armed with considerable new data and analysis, we have sharpened our numerical forecast of the likely production level in 1985 and see more clearly a continued decline in production throughout the decade.

B. In particular, we do not believe that Soviet plans, which call for growth in oil production through 1985 at a rate of about 1 percent a year, are achievable.

   1. The fundamental problem is that the Soviets have been depleting their oil reserves, especially their high quality reserves, more rapidly than they have found new reserves.

   2. Most serious is the worsening quality of reserves. The Soviets have already thoroughly drilled nearly all their known giant fields, and they have reported no discoveries of new giants for seven years. New production is coming from smaller fields or from less productive strata of large fields. Consequently the amount of drilling needed per unit of new oil output is increasing rapidly.

    3. At the same time, depletion of existing fields is also increasing so that Moscow finds itself on an accelerating treadmill--needing to invest at an increasing rate just to keep output from falling.
    4. Since 1977, Moscow has in fact made a massive effort to sustain oil production capacity. This effort is focussed on the West Siberian Basin, where increases in output are planned during 1981-85 to offset the inevitable declines in the older oil production regions.
    5. The investment effort is falling behind plan, however, and we believe it is overly amibitous, given the difficult physical conditions in West Siberia, its remoteness, and the growing complexity of production requirements. Consequently, we expect production to begin declining before the mid-1980s.

C. In the longer term, Moscow will have to greatly accelerate the rate of discovery of new oil reserves to avoid a further decline in output. This is not impossible, but the odds are strongly against it. Many new fields will be found, but few are likely to be large.

D. In the short run, increased use of Western equipment--for both drilling and fluid lift--could help delay the inevitable decline in Soviet oil production.

E. Oil is by no means the only Soviet energy problem, however.

   1. Coal--which currently accounts for more than one-quarter of total energy production--has declined steadily since hitting a peak of 724 million metric tons (6.8 million b/d oil equivalent) in 1978. Production last year was 716 million metric tons and may be only 710 million metric tons this year.

      a. Underlying the industry's poor showing has been a slowdown in new commissionings and an increase in mine depletion.

      b. At the same time, the increasing depth and reduced seam thickness of coal seams at many underground mines have virtually wiped out any productivity gains.

   2. Although the new five-year plan targets call for production in 1985 to reach 770-800 million metric tons, we believe 740 million tons is a more realistic figure.

  - a. Moreover, the energy value of that output, expressed in million b/d oil equivalent, will probably be no higher than the 1980 level (6 million b/d) because much of the increase will come from poorer quality coal.
  - b. Although the USSR possesses enormous coal reserves, most new basins are located in Siberia, far from major consuming centers, and contain coal with a lower heat value. Major investments will be needed to develop these fields, but it will be at least another decade before they will have a major impact on production.

F. Growth of electric power production will also slow.

1. We expect annual growth in power output will average 3.7 percent during 1981-85, compared to 4.5 percent during 1976-80.
2. Nuclear power will provide much of the increase in power production.
   - a. Moscow expects new nuclear power plants to account for more than 50 percent of the planned power increment, with nuclear production rising from 70 billion kwh in 1980 to 220-225 billion kwh in 1985.

b. Although shortages of labor and nuclear plant equipment will probably cause the nuclear program to fall 10-20 percent short of that goal, its contribution to energy output will still be appreciable.

c. The share of nuclear power in total power output will increase from 5 percent in 1980 to almost 12 percent in 1985, while nuclear power's contribution to total Soviet primary energy production will rise from 1 percent in 1980 to 3 percent by 1985.

G. In contrast to oil, coal, and electric power, prospects for natural gas remain bright.

1. With roughly one-third of known world gas reserves, gas output will contribute roughly 90 percent of the net increase in Soviet primary energy production during the 1980s.

a. By mid-decade, the Soviets will probably supplant the US as the world's largest gas producer, with output of roughly 58 billion cubic feet/day (cf/d)--almost 10 million b/d in oil equivalent.

   b. By 1990, gas probably will be the largest single source of Soviet energy, with production at roughly 69 billion cf/d.

H. Reaching these targets, however, will be a costly undertaking.

   1. During the next 5 years, the Soviets must build an unprecedented 6 major trunklines from Siberia--each one a larger undertaking than the Alaskan oil pipeline--even though labor and equipment are already stretched thin. (Currently, the Alaska pipeline would cost roughly $10 billion to build.)

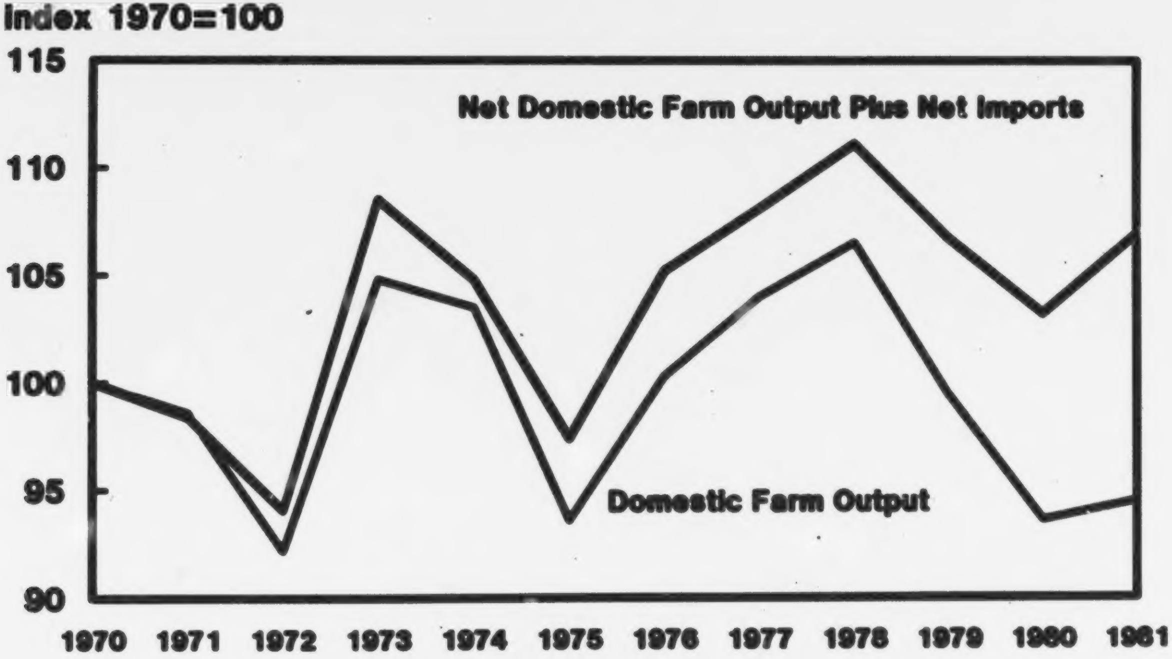
   2. At the same time, the need to build support facilities--such as roads, all-weather ports and electric power facilities--will also tie up enormous investment resources.

I. Moscow, however, will have to pay this price.

   1. Gas will be a critical source of hard currency for Moscow by the mid-1980s, since oil exports to the West may well decline sharply by that time unless the Soviets are more successful in substituting gas for oil than they have in the past. Moscow already plans to step-up substitution substantially and any further increase in this program would have to come at the expense of other sectors of the economy.

FIGURE 3

USSR: Per Capita Availability of Agricultural Products*

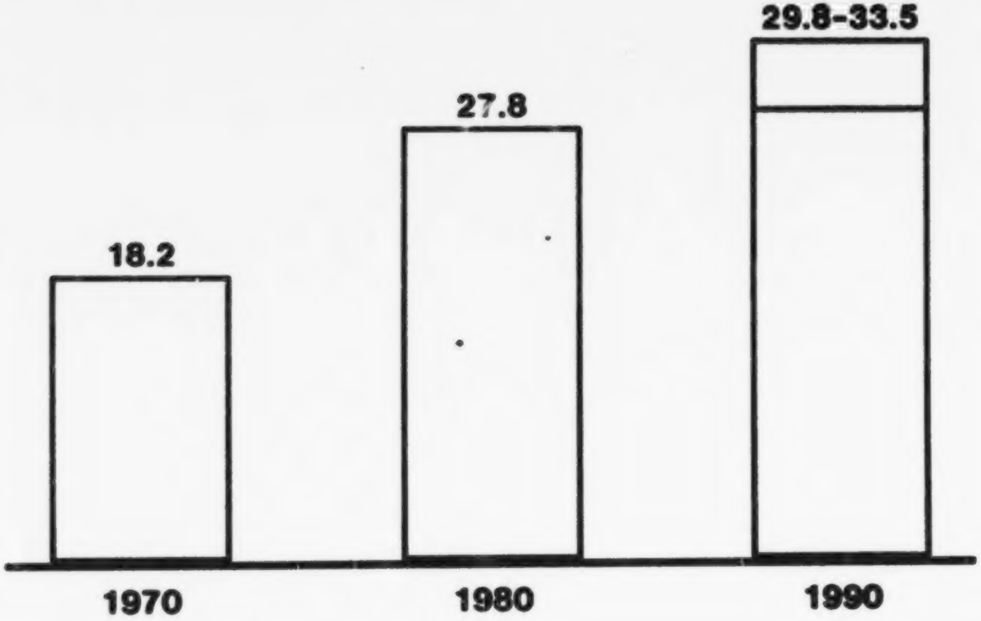


*Indexes are based on per capita physical quantities produced and imported, valued at 1970 average realized ruble prices.

FIGURE 4

USSR: Primary Energy Production

Million b/d oil equivalent



2. If the proposed Siberia-to Europe gas pipeline deal goes through, gas revenues by 1990 would replace 50-70 percent of oil's hard currency earnings of $12.5 billion in 1980, depending on whether one or two lines are built.
3. Without the pipeline project, gas earnings would equal only 25 percent of oil's 1980 revenues, creating a serious constraint on Soviet import capacity.

J. Despite the rosy outlook for gas output, the domestic economy will still be hard hit by the decline in total energy growth. The Soviets simply have not curbed their energy appetite as much as some other industrial nations, and despite their increased concern with energy savings, they will achieve only minimal success in conservation by the mid-1980s.

1. Figure 5 indicates that, in contrast to the West, Soviet energy consumption has continued to grow more rapidly than GNP. (See Figure 5)
2. Although the 1981-85 Plan calls for conservation of fuels across a broad spectrum of the economy, the current structure of Soviet energy demand and the nature of the Soviet economic system will

restrict the energy savings attainable in the next few years.

K. A major reason conservation gains are difficult in the USSR is that most of them require massive investments to modernize and renovate industrial and power-generating facilities. Relatively little conservation is possible in households, transportation, and other uses. (See Figure 6.)

  1. Soviet transportation is already energy-efficient and does not have the potential for the large savings that were achieved relatively rapidly in many Western countries.
  2. Residential and commercial energy use is comparatively small. This is an area where energy savings in the West have been important.
  3. In the USSR, therefore, the largest energy savings must come in the industrial and electric power sector. Producing and introducing energy efficient equipment, however, will require most of the decade.

L. Paradoxically, the Soviet command economy also seems less effective than many Western economies in stimulating or enforcing conservation efforts.

1. The Soviets currently do not monitor energy use of even the largest consumers--industrial and residential users--because reliable metering devises are scarce.
2. Soviet planning procedures and managerial incentives, by their very nature, do not encourage conservation at the factory level.
    a. The emphasis placed by planners on the amount of industrial output, rather than on profit maximization, leads plant managers to concentrate on achieving production goals even if energy and other inputs are used inefficiently.
    b. Although energy prices will be raised in 1982, industrial users will still focus on the overriding goal of meeting goals for gross value and assortment of output.

M. While across-the-board savings in energy are unlikely by the mid-1980s, Moscow is urgently seeking to reduce the growth in oil consumption through substitution of other fuels.

1. Natural gas, and to a lesser extent coal, are to substitute for oil, primarily as a fuel for use with new capital equipment that otherwise would have used oil.

2. This program is proceeding haltingly, however, partly due to slow growth in coal output and to Soviet inability to increase, rapidly the nationwide grid of gas distribution pipelines. We, therefore, expect total domestic Soviet oil demand to grow through the mid-1980s.
3. Moscow can cushion the effect of declining oil production and increasing demand for the next few years by cutting exports to the West, but the Soviets will have to choose between the need to export energy to pay for high priority imports and the direct requirements for energy in their domestic economy.
4. Alternatively, Moscow could cut exports to Eastern Europe, but only at the risk of worsening a highly unstable situation there.

HARD CURRENCY EARNINGS

V. The USSR has benefited greatly from the unique circumstances of large windfall gains in 1979 and 1980 from a favorable shift in the terms of trade.

A. Moscow has thus been able to turn to the foreign trade sector for relief from its domestic problems.

   1. Without agricultural imports the Soviet diet would have deteriorated.
   2. Imported steel has helped offset domestic production shortcomings.
   3. Purchases of equipment and tubular steel pipe from foreign suppliers have allowed stepped-up investment and exploitation of critical energy resources.

B. In the past three years Moscow substantially strengthened its international financial position primarily by capitalizing on rising energy prices.

   1. During this period, oil prices on average rose from about $14 a barrel to roughly $35 a barrel.
   2. Hard currency export earnings from oil as a result more than doubled from $5.5 billion to $12 billion.
   3. Sales of natural gas grew equally spectacularly.
   4. Earnings from oil and gas alone now account for about 60 percent of all hard currency export earnings.

C. Spiraling gold prices and stepped up arms sales gave Moscow an added boost to hard currency earnings.

1. The average price of gold rose from less than an average of $200 an ounce in 1978 to an average of more than $600 an ounce last year.

(Security deletion)

D. With the push from energy, gold, and arms sales, total hard currency earnings in the West reached a record $30 billion in 1980.

E. While hard currency earnings thus climbed steeply, hard currency outlays remained static. Soviet imports of machinery and equipment leveled off at $6 billion after rising sharply in the early and mid-1970s.

1. Delays in putting imported equipment into operation contributed to the leveling off of new orders.
2. The huge backlog of unfinished construction in the USSR slowed capital formation throughout the economy.

F. Helped by the improvement in its terms of trade with the West, the USSR boosted imports of agricultural and steel products, cut back on its exports of oil, and sold less gold, while holding its debt constant.

1. At the beginning of 1981, the USSR had nearly $9 billion in Western banks, a record gold stock of 1,800 tons (worth $26

billion at $450 per ounce), and a solid credit rating with Western banks.

G. This year, however, Moscow's trade position has taken a turn for the worse, and future deterioration may be in the offing.

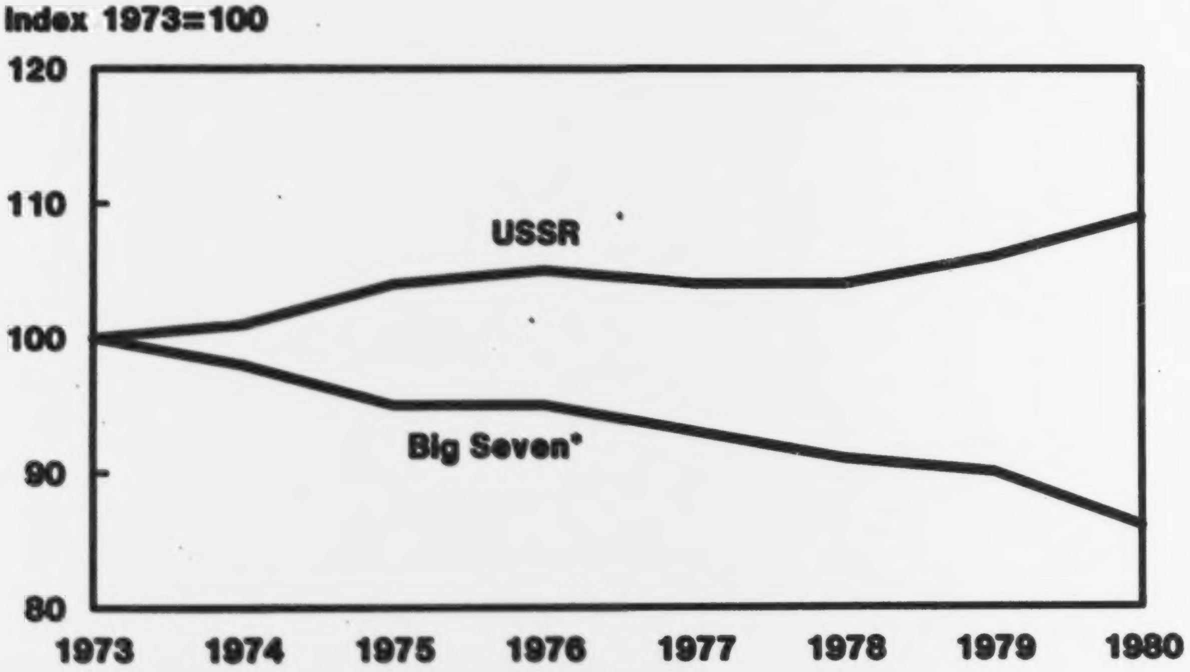
1. The Soviet trade deficit could double to $5-6 billion as this year's poor harvest again pushes up agricultural imports and soft world demand cuts earnings from oil sales.

    a. Poor harvests in 1979 and 1980 and higher world market prices have been responsible for most of the increase in Soviet hard currency imports in 1980-81, pushing the agricultural bill from $3 billion to $9 billion in 1980. This year the total could reach almost $12 billion, or over 40 percent of Moscow's hard currency imports. (See Figure 7.)

    b. At the same time, weaker world oil prices this year and another fall in export volume are likely to result in a leveling off and perhaps a decline in the value of hard currency exports to the West.

FIGURE 5

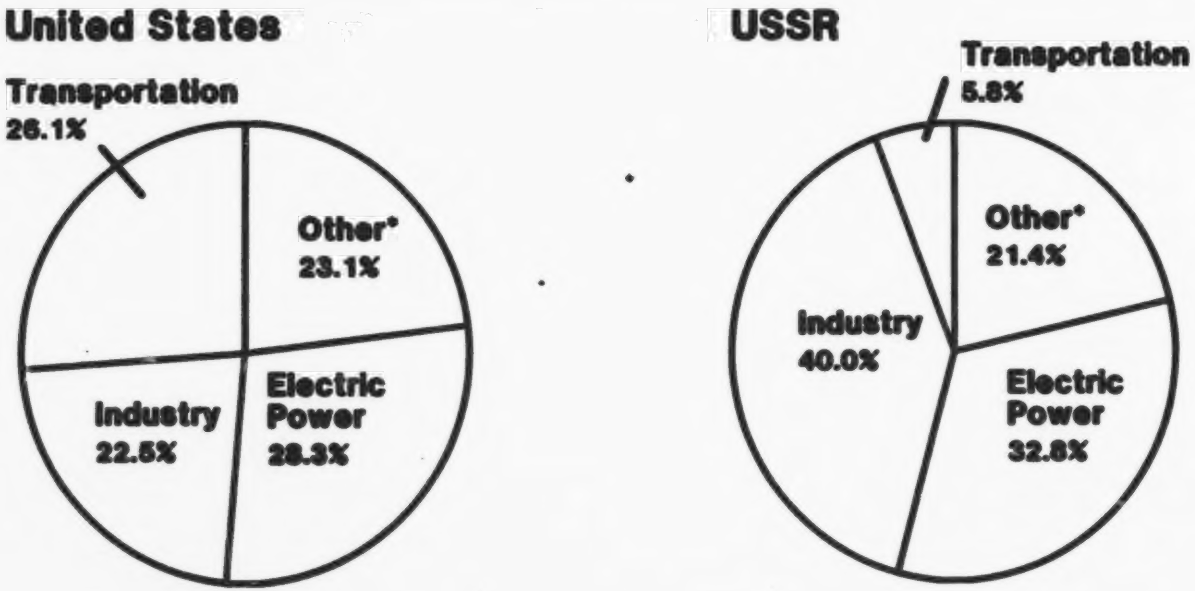
Energy/GNP Ratios



* The Big Seven includes the US, Canada, West Germany, France, Great Britain, Italy, and Japan.

FIGURE 6

United States and USSR: Gross Energy Consumption, 1975



* Other includes agriculture, construction, and heating for residential, commercial, and government buildings.

Unclassified
[illegible]

   c. A rise in exports other than oil is unlikely to offset the loss of oil earnings. While natural gas sales have risen steadily in recent years, at $3.5 billion its share of total exports is still modest.

   d. Sales of civilian machinery and equipment for hard currency have plateaued and may in fact fall; exports of wood, metals and non-fuel minerals are growing little if at all.

H. In spite of these developments in the trade accounts, we expect Moscow to close out 1981 with a current account surplus, albeit one much reduced from the 1980 level.

   1. Earnings from services, arms exports, and gold sales should more than offset the $5-6 billion trade deficit and the higher interest payments on foreign debt.

      a. Recent evidence suggests that Moscow is again active in the gold market.

I. If the trade trends evident since 1979 continue, however, the USSR could experience a decline in its hard currency exports before the mid-1980s.

1. Oil export earnings will be squeezed by stagnant or falling production, rising domestic consumption and probably weak prices.
2. The Siberian gas pipeline--the only potential large earner of foreign exchange --will not be fully operational until 1986 or 1987 at the earliest.
3. Some potential may exist for increasing arms sales. (Security deletion)
4. But, the export picture is not bright for other Soviet products.

J. Thus, Moscow will have to rely more on gold sales and on Western borrowing, if it is to avoid the unpleasant task of cutting imports of agricultural products or capital goods.

1. Given its low debt service ratio, Moscow should have little difficulty raising additional funds as long as credits are tied to imports and the political climate does not deteriorate greatly.
2. But even so, the Soviet hard currency position will be extremely tight.

K. Under the best of circumstances, moreover, the USSR's foreign payments position will almost certainly restrict Moscow's ability to supply hard currency goods and assistance to its East European allies.

1. Since the summer of 1980, Moscow reportedly has provided some hard currency support to Poland.
   - a. More significantly, the Soviets have allowed Warsaw to run a trade surplus of upwards of $2 billion.
   - b. Counting all forms of aid, the annual cost of supporting Poland may be close to $4 billion.
   - c. This opportunity cost of direct and indirect aid for all of Eastern Europe is now close to $20 billion.
2. Not only will Poland need large amounts of aid for the forseeable future, but other Warsaw pact allies are either in or heading for economic difficulties.
   - a. These governments are sure to use the Polish example in buttressing their arguements for additional Soviet assistance.
   - b. Any sizable increase in East European demands will compound the unpleasant choices facing the Soviet leadership.
     - (1) A decision to market more gold could easily depress prices and quickly lower Soviet earnings.

(2) Moscow would probably prefer to step up borrowing from the West, but to do so against the current backdrop of high interest rates would raise substantially the cost of servicing its debt.

(3) In any event, either option would be a stop-gap measure--ultimately the leadership would have to address the question whether or not to cut back on much needed agricultural imports or on purchases of nonagricultural goods, which already are declining in real terms.

DEFENSE

VI. These present strains in the domestic economy, coupled with increasing costs and uncertainties in Eastern Europe, pose some difficult policy choices for the Soviets. From the US perspective, certainly a key issue is whether the Soviets will sustain the current growth of military outlays.

A. Indeed, the dominant feature of Soviet defense spending over the past 20 years has been its persistent expansion. Over this period, Soviet leaders have not acted as though costs have been a major factor in their military decisions. Defense programs have been well funded, even during periods of lagging economic growth, and the follow through on new programs has been strong.

B. Growth in defense spending, which began in 1960, has averaged about 4-5 percent a year during the Brezhnev era --about the same as the growth of the overall economy. Over most of the period, then, defense maintained a fairly constant claim on economic resources--12 to 13 percent of GNP. (see Figure 8.)

C. But recently this situation has changed. Despite worsening economic performance of the past few years, defense has continued to grow at roughly its historic rate and now claims 13 to 14 percent of GNP.

   1. If defense spending continues to grow at this pace and economic growth continues to decline, defense could consume about 15 percent of national product in the mid-1980s and as much as 20 percent by the end of the decade.

D. The change in circumstances again raises some of the longstanding questions regarding Soviet military planning:

- -- will they maintain the historic share that defense has taken from GNP which would require a slowdown in the growth of defense spending as economic growth slows; or
- -- will they maintain the historic growth rate in defense spending which would require an increasing shift in resource allocation away from consumer welfare and economic growth in favor of defense; or
- -- will they accelerate defense spending in response to the recent resurgence of US defense allocations and despite the exacerbation of economic problems already noted.

E. Although all present evidence suggests that they have chosen the second option, I'd like to conclude today's session by reviewing the bidding on all these Soviet policy options.

F. First, the Soviets could opt for reducing the growth rate of the defense budget. This is not to say that a lower growth budget would solve the problem of slowing economic growth--it wouldn't.

1. A lower growth defense budget cannot offset all of the adverse trends that I have already discussed.

2. A lower growth policy, however, would free more resources for investment and therefore could be an attractive policy option.
    a. As you can see from the next figure, civilian machinery output grew faster than military machinery output between 1965 and 1978. (See table 1)
    b. As economic problems worsened in the late 1970s, however, growth of military machinery output increased, resulting in a slowdown in civilian machinery growth.
3. Because the machinery sector of the economy also provides investment goods and consumer durables, judicious reallocation of machinery and equipment and construction resources could loosen but not remove some of the current and developing bottlenecks I've already mentioned.

G. In terms of specific tradeoffs between civilian and military production, a number of military programs preempt high quality resources that could be used for important civilian products. (Security deletion)

H. Not only do military programs preempt materials, they also preempt the highest quality capital and labor.

TABLE 1

GROWTH RATES OF SOVIET MACHINERY OUTPUT AND MILITARY HARDWARE PROCUREMENT

	1966-70	1971-75	1976-80	1981
Civilian Machinery	8.2	9.0	5.8	1.8
Military Machinery	3.6	4.5	3.4	5-7

(Security deletion)

I. Although such a low growth policy might be attractive from the standpoint of its economic benefits, it also carries political risks (and military costs).

   1. Lowered growth in Soviet defense spending would be opposed by powerful defense and defense industrial interests, particularly in view of the U.S. buildup.
   2. But even if growth in defense spending were cut back, Soviet military capabilities would continue to improve through the 1980s.
   3. Given the tremendous size of Soviet military procurement--more than 1 1/2 times the size of US procurement in recent years--a change in its growth rate or even freezing it at today's level is unlikely to have a major impact on overall inventories and Soviet force potential until the 1990s.

J. I want to stress at this point that we have not seen any evidence of a reduced growth on defense spending. Indeed, indicators of future defense spending point to continued real growth at the historic rate, at least through 1985.

FIGURE 7

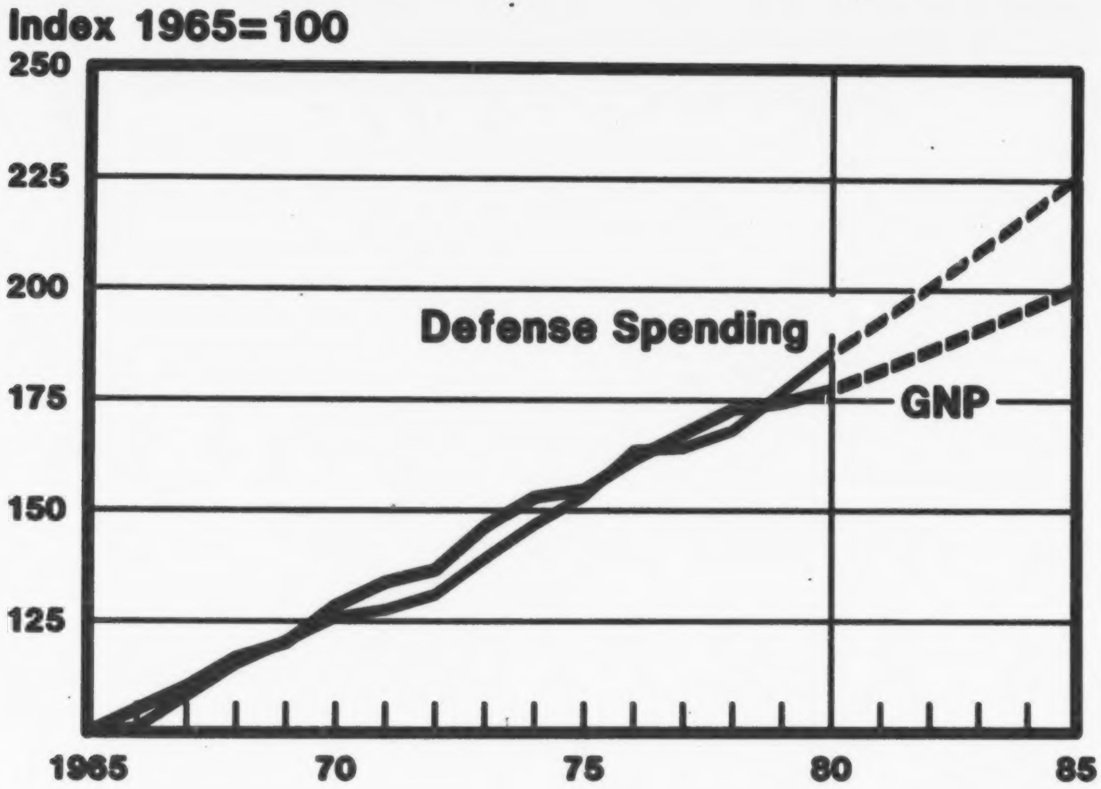
USSR: Hard Currency Imports*

	1976	1977	1978	1979	1980	1981**
Total Hard Currency Imports (billion US $)	14.8	13.7	16.6	21.2	26.2	29-30
Agricutural Imports (billion US $)	4.1	3.2	3.8	5.5	8.8	12.5
Agriculture's Share of the Total (percent)	27.7	23.4	22.9	25.9	33.6	41.7-43.1

*Current prices

** Estimated

FIGURE 8


Growth in Soviet Defense Spending and GNP
Index 1965=100
250
225
200
175
150
125
Defense Spending
GNP
1965
70
75
80
85

1. Evidence of weapons production and testing, as well as capital construction at defense industries and military R&D facilities suggest continued real growth in defense spending, at least through 1985, at about 4 percent a year.

   (Security deletion)

2. Another indicator of Soviet intent comes from the Eleventh Five-Year Plan.
   a. The guidelines for the Plan placed the greatest emphasis on the development of heavy industry, with the highest growth targeted for those branches of heavy industry most closely tied to the military.
   b. Our analysis of these targets indicate that there is room in the plan for continued growth of defense spending at historical rates.
3. To sum-up, our current estimate of Soviet intentions is for continued growth in defense spending at the past historical rate of about 4-5 percent per year. Of course, any recent decisions the Soviets may have made on increases or cutbacks in the growth of defense would not yet be observable.

K. Finally, the Soviets could choose to accelerate defense spending because of what they view as a deterioration in the international climate.

1. A succession of statements by top Soviet military leaders, including Defense Minister Ustinov, have proclaimed that the USSR will watch any US military buildup. Although these statements in no way bind Soviet defense policy to a particular direction or level of effort, they are probably meant as a serious statement of Soviet intent to preserve central elements of the strategic military balance in roughly their current proportions.
2. Soviet statements, moreover, have become increasingly acrimonious, which may in turn suggest that Moscow is becoming more anxious about the near term decisions that it might feel compelled to make in order to counter US programs.

   (Security deletion)
3. If defense spending accelerated, however, there would be a trade-off with investment in some civilian sectors. Heavy industry has powerful patrons in the political leadership, and the priority needs of energy, machinery for industrial

modernization, and transportation could make it difficult to skimp on allocations in these areas.

   a. Consequently, investment in such areas as consumer durables, services, housing, and machinery and equipment for the processed food and soft goods industries likely would be primary trade off areas, with high-priority civilian areas being secondary targets.
   b. Lack of attention to the consumer sector could have two unpalatable consequences: a worsening of already poor prospects for improving labor productivity and an increase in worker discontent.

4. Moscow is counting heavily on large gains in labor productivity to meet the economy's output goals.
   a. The plan directives currently stipulate that 90 percent of the growth in industry and all of the growth in agriculture must come through increases in productivity.

b. Without some improvement in consumer welfare, chances of generating the large productivity gains implied in the 11th Five-Year Plan will be much reduced.

L. Labor unrest would be even more unpalatable to the leadership than lagging productivity. However, we believe the present leadership will be inclined to continue the current mix of cosmetic concessions, short-term fixes, and patriotic appeals, rather than to allocate a greater share of output to consumption. A decision to shift resources from investment or military spending, if it comes, probably would be the work of a new leadership.

DOLLAR COSTS OF SOVIET PROCUREMENT

Senator PROXMIRE. Mr. Rowen, how do you determine—when you say Soviet military procurement is one and a half times ours. How do you make that comparison?

Mr. ROWEN. That is, of course, an aggregate that's built up by examining a very large number of types of weapons.

Senator PROXMIRE. It seems to be it is so very difficult to do that because of the difference in the composition of even similar weapons systems like aircraft. For example, some of our fighter planes cost such a tremendous amount compared to what they cost in the past. They have in them such complicated systems in all kinds of ways, that it seems to me to try to compare one or two or three or four aircraft of the Soviet Union with one, two, three or four of ours wouldn't really tell you very much about how much in resources we put into out procurement, and how much in resources they put into theirs.

Mr. ROWEN. Perhaps Mr. Steiner can tell you the method used.

Mr. STEINER. Senator, that particular figure is based on our extensive effort to dollar cost the Soviet military hardware procurement program. So, it is the aggregate figure based on Soviet military procurement in real resource terms as measured in dollar prices.

Senator PROXMIRE. Let me see if I understand what you are saying.

Does that mean what you try to do is determine how much it would cost us to produce the number of tanks they produce, for example?

Mr. **Steiner**. Exactly, Senator. In past years, we have given you extensive briefings on our dollar cost estimate—its methodology and results.

These data are based on that methodology—the basic concept being what it would cost in the United States to produce the Soviet military hardware.

Now, the situation would be very similar, although not quite as pronounced, if you were going to make the same comparison in rubles.

INFINITE PRICE PROBLEM

Senator **Proxmire**. But, to the extent that our technology is ahead of theirs, it could be that we have an unmeasurable quality of advantage, or maybe not.

Mr. **Steiner**. I think you are referring to the discussion we had last year, to the infinite price problem. In other words, if there is a product which can be produced in one economy but not in the other, then in theory the price of that product is infinite.

Senator **Proxmire**. It is just not comparable.

Mr. **Steiner**. In theory it would be infinite. We just could not put a price tag on that. You can put all the resources in the world on it, but if you don't have technology to put it together, you couldn't build it.

Nevertheless, we have handled that—as Mr. Barry discussed last year—the same way one handles a temporal comparison for a single country. For example, in the United States, if there was a product produced in 1980 that could not be produced in 1970, the constant price of that goods in 1970 prices in theory would be infinite.

But we handle this problem the same way we have handled all international comparisons, and that is to use an exchange rate, implicit exchange rate, which is derived using the nearest applicable product which can be produced in both time periods or both countries.

Senator **Proxmire**. Can we or can we not make a general conclusion that we do have an advantage in most military technology areas as far as industrial technology areas, and that we may not fully reflect the difference between the Soviet's procurement and the capability of that procurement compared to ours.

Mr. **Steiner**. I would say that we have bounded the problem, Senator, by looking at the comparison in ruble terms and the comparison in dollar terms. In ruble terms our results are that the Soviet defense spending is roughly 30 percent greater than United States. In dollar terms it is roughly 50 percent greater than United States.

The ratio of the dollar cost of all Soviet defense activities to U.S. defense spending for 1979 is 1.5 to 1. The same comparison made in ruble prices is 1.3 to 1. These figures yield an index number spread of 15 percent—1.5 divided by 1.3 equals 1.15.

Senator **Proxmire**. Now you are shifting it, saying defense spending. I was thinking about procurement.

Mr. **Steiner**. The ratio of the dollar cost of Soviet procurement of weapons and equipment to similar U.S. spending is about 1.6 to 1. In terms of ruble prices, the ratio is about 1.3. These figures yield an index number spread of about 25 percent.

Senator **Proxmire**. See, I am trying to stress technology. Obviously, if we try to reproduce the Chinese army—we went through that, I guess, the last time——

Mr. **Steiner**. Yes.

Senator **Proxmire**. The cost to us would be greater than we are spending on defense, in spite of the fact that it is clear that our military force, the Soviet military force is vastly superior to the Chinese.

So that I think it is hard to make an assessment that because they are spending more money, or because they are spending more of their resources, if they do not have the technology, may or may not mean that they have a superior military force.

Mr. **Steiner**. Once again, Senator, all I can say to that is that you face the same issue when you do Western economic analysis in the United States on growth in gross national product over a period of time. In fact, in the United States the Department of Commerce uses some 500 price indices to deflate a roughly $3 trillion GNP or roughly one price index for every $6 billion.

When we convert U.S. defense spending to rubles, we use one exchange rate for every $3 billion.

In other words, in those aggregate terms we are using twice as many exchange rates just to capture the factors you noted. When we estimate Soviet defense activities in dollars, we use extensive industrial engineering analyses to be able to capture the Soviet technology.

Senator **Proxmire**. Does that really deal with the problem I raised in comparing, for instance, the Chinese economy, Chinese military with our military; or the technology in Russia with the technology in this country?

Mr. **Rowen**. In the case of the Soviet Union, I wonder if it is an empirical question as to whether there are that many weapon types. Where it is our estimate that the Soviet Union would not be capable of building something comparable. I would have thought that is not so any more. Soviet technology has been improving. But that is really not quantitatively such an important point now. Perhaps it was 20 years ago.

Mr. **Steiner**. That's an excellent point, and the analysis we have done on that—and we have done quite a bit over the last 20 years—has shown that in terms of the total production—the total number of systems being produced in any given period of time—this infinite price problem is very small.

Senator **Proxmire**. Will you submit the data that you have on that point for the record?

And second, do you have a comparison between the Warsaw Pact expenditures and the NATO expenditures, and how would they compare, roughly.

Mr. **Steiner**. We will submit for the record information on the relative levels of technology.

[The information subsequently supplied for the record is a security deletion.]

NATO VERSUS WARSAW PACT

Mr. **Steiner**. On the NATO/Warsaw Pact comparisons, I am sorry to report that the situation is exactly as it was last year when this issue was raised. Because of resource constraints, we have not engaged in a direct dollar costing of non-U.S.-NATO countries or the non-Soviet-Warsaw Pact countries.

Senator **Proxmire**. Why wouldn't that be of very great significance and worth applying resources to develop it?

It seems to me that any realistic situation we can imagine would very likely involve both Warsaw Pact and NATO forces.

Mr. **Steiner**. I think the question here, Senator, is why do we do the dollar costing and ruble costing in the first place. When we do dollar costing we are essentially trying to size the Soviet effort for U.S. policymakers in terms which are familiar to them. That's why we use dollars.

When we make ruble estimates, we are trying to assess the economic impact of the Soviet Union to get an idea of their resource commitment to defense.

Senator **Proxmire**. It goes farther than that. Look at it from my standpoint. It's a question of whether we are spending enough so that we are comparable with the Soviet Union. And in doing that we look at the defense contribution of England and Germany and Italy and the other NATO countries. We have to look at that in a limited way. We at least have to have that in the back of our mind.

Mr. **Steiner**. But you are looking primarily at military capabilities when you say, "Isn't U.S. defense spending sufficient for its requirements." You are dealing primarily in an effectiveness scenario.

In other words, if you ask "are U.S. military forces sufficient to perform their required duties?" you are not really interested in resource commitment, but rather in the military forces in being, the morale of the troops, the effectiveness with which they would be deployed.

So, in the NATO/Warsaw Pact comparison that you are discussing here, I would think you really would be much better served by looking at the military forces in being and their capability.

Senator **Proxmire**. I think we would be well served in that, too. But you constantly run into the criticism, or the argument in our country, that the Soviet Union is spending far more than we are and that the Soviet forces, the Communist forces—meaning the Warsaw Pact forces—are outspending the free world in the military area, and investing more.

And I think that that may well be true. But, unless you have some notion of what the far wealthier NATO forces are actually spending compared to the far poorer Warsaw Pact, we don't have a comprehensive picture of this at all.

Mr. **Rowen**. I agree with you, Senator. The subject does come up, and that makes it relevant, obviously.

Senator **Proxmire**. And it very greatly conditions our policies. Presidents are elected or defeated on this; Members of Congress are elected or defeated on the issue. They carry into a determination of what we are going to do on our appropriations and authoriziations in the military areas and other areas, the kind of conviction that the American people have.

Mr. **Steiner**. If I could note——

Senator **Proxmire**. And that comes to a very great extend, from your analysis.

Mr. **Steiner**. Although the CIA does not prepare such an estimate, the Defense Intelligence Agency has prepared dollar costs comparisons of NATO and the Warsaw Pact, so they are available to the U.S. Government.

Mr. **Rowen**. We will see what we can get you on this.

Senator **Proxmire**. I would appreciate that.

[The following chart was subsequently supplied for the record:]

Mr. **Rowen**. It is relevant, obviously. A most obvious question, however, about the relevance of the comparisons of the alliances on both sides, really has to do especially in the 1980's, with whether one really expects either of these systems to act in a unified way, and that is certainly a question.

But the comparison, nonetheless, is a relevant one.

Senator **Proxmire**. Go right ahead, sir.

EFFECTS OF DEFENSE SPENDING ON THE ECONOMY

Mr. **Rowen**. One possibility is that the Soviet Union will choose to accelerate defense spending about its current rate of 4 to 5 percent annually, because of what they view as a deterioration in the international climate. That is, they might develop additional weapons, make additional investments in defense industries, to produce more weapons, in the mid-1980's and late 1980's.

However, I think it's evident from everything that we have said here that this would impinge on the Soviet civilian economy especially hard; that consumer durables, services, and housing would be likely areas for cutbacks; and it would have a severe impact on labor productivity prospects.

As I think this presentation suggests, the pressures indeed will be there, and growing, for them to reduce rather than to expand. They face really quite a dilemma. So in sum, I would simply say that the Soviet economy is in real trouble, and its problems are becoming progressively more severe.

And perhaps most importantly, I would say, in contrast with the U.S. economy, there doesn't seem to be any light visible at the end of the tunnel in the Soviet Union.

SAMOTLOR OIL FIELD

Senator **Proxmire**. Now, several years ago the CIA described the problem of water flooding of the giant field of Samotlor, and the inefficiency of Soviet oil production methods.

Were you correct in that diagnosis?

Mr. **Jackson**. Water flooding is an accepted strategy worldwide for improving oil recovery. Regarding Samotlor, we had a specific error in our 1977 report about the water cut, which we acknowledged and corrected several years ago. [Security deletion.]

Having said that, I think we may have made too much of water flooding problems in the past. The Soviets have done some damage, but probably not vast damage, as may have been implied previously.

OIL PRODUCTION

Senator **Proxmire**. Along the same line, it is now Ocotber 1981, and the oil production rate is still about 12 million barrrels a day. That 's considerably higher than the CIA thought it would be back in 1977.

Would you explain why you dispute the argument that the Soviets are controlling the level of production at the rate they desire, and that they could produce at a higher rate if they wanted to?

And also, explain what evidence there is that there will be a decline. And when do you believe the decline will begin?

Mr. JACKSON. Let's take one question at a time. I have not heard the argument that the Soviets are controlling production levels at desired rates articulated in detail.

Senator PROXMIRE. You haven't heard people arguing that they could produce at a larger rate, if they wanted to?

Mr. JACKSON. I have heard it in general terms, not in specifics as to where in the country such control might be occurring.

I believe that argument can be refuted in several ways. I'll give two. Note, however, that in the strictest sense the argument is true but immaterial. Strictly speaking, few fields in the world are produced at maximum instantaneous rates. For a variety of technical reasons, such an operational mode could not be sustained for long, and hence the added investment for equipment to support such rates is not warranted.

An obvious refutation can be developed by considering Soviet success relative to production plans. At the beginning of the 10th 5-year plan, in 1976, the 1980 target for oil production was 620-640 million tons—12.4-12.8 million b/d. By the start of 1980 this target had been lowered to 606 million tons—12.12 million b/d—because of many supply-side problems that arose in the intervening years and not because of decreased demand. Even after this drastic reduction, reported actual production in 1980 was only 603 million tons—12.06 million b/d. Surely the Soviets would have turned on reserve production capacity to make up at least the 3-million-ton deficit had such capacity been available.

A second and more technical refutation comes from a consideration of Soviet-producing capacity. [Security deletion.] The reported rate of decline had risen to about 15 percent in 1978. [Security deletion.] Such a decline is incomparable with the notion that production could be increased significantly, since a conservative policy would translate into relatively minor declines in installed capacity.

Your second question was about what evidence there is that there will be a decline.

Our forecast of a decline in Soviet oil production is a judgment derived from in-depth study of a sizable body of data.

Outside West Siberia, Soviet plan figures for the low end of the target range anticipate a drop in production of 1.1 million b/d, essentially matching the decline during the 10th 5-year-plan period, when annual declines averaged 220,000 b/d. Annual declines have been increasing, however, with drops of 300,000 b/d in 1979 and 250,000 b/d in 1980.

In the long run, the Soviets need to find large fields that can be developed cheaply to ease the investment burden. We do not think the chances of such success are high.

Your third question was when do we believe the decline will begin. We estimate that the decline probably will begin the next 3 years. At the outside, the Soviets might succeed in holding production near 12 million b/d through 1985. We are assuming that discoveries in hand, but no new discoveries, must support production through 1985.

DIA OIL PRODUCTION ESTIMATES

Senator **Proxmire**. The Defense Intelligence Agency has a much more optimistic—that is, optimistic from the Soviet Union's standpoint—forecast of Soviet oil production. They predict there will be a steady, although very moderate, increase throughout the rest of the decade.

Mr. **Jackson**. There are two differences between our forecasts. First, DIA believes that Soviet leaders and oil experts have a solid long-range understanding of the magnitude of the problems they face. We do not.

Our second fundamental difference is that DIA believes the base of discovered reserves is adequate to sustain high-production levels through the decade and beyond. Again, we do not.

Senator **Proxmire**. Well, give me the figures on your estimate of Soviet oil reserves, and the DIA's estimates, and why is there that difference?

DIA told us 80 to 85 billion barrels of reserve. What's yours?

Mr. **Jackson**. Our estimate is somewhat lower than that.

SALYM FIELD

Senator **Proxmire**. DIA's testimony discusses the new Salym field, which—reserves are discussed as enormous, and estimates this field will be brought into production in 5 years.

Will you comment on the Salym field?

Mr. **Jackson**. The Salym field was discovered in 1965. It is essentially an oil shale, 2 miles deep. The Soviets have drilled it, trying to establish commercial production, but they have as yet been unable to do so. [Security deletion.]

In short, we have seen no evidence that they have overcome basic technical problems to date, and hance no evidence that that field will ever be commercially productive. [Security deletion.]

GAS PIPELINE

Senator **Proxmire**. What's your assessment of the risks that West Germany, France, and other NATO allies may become overly dependent on the Soviet Union for natural gas?

Mr. **Rowen**. Let me respond to that one. The policy of these countries is to limit their dependency. In the case of Germany, the figure that's been stated has been of the order of 30 percent—no more than 30 percent of natural gas; would be like 5 percent of total energy. And I believe a somewhat similar proportion for France and other European countries.

This, of course, is a limitation they have imposed for the reason you suggested: They do not want to be too dependent on the Soviet Union. These governments have taken the position that their alternatives on dependence on natural gas, or oil, for that matter, is worse. That is, dependence on unreliable Persian Gulf oil, or gas from Algeria.

Our own view has been much more reserved and cautious than the view of these governments, and it has seemed to many people in this Government that in fact the dependence of these countries would be rather substantial, or could become substantial, that some

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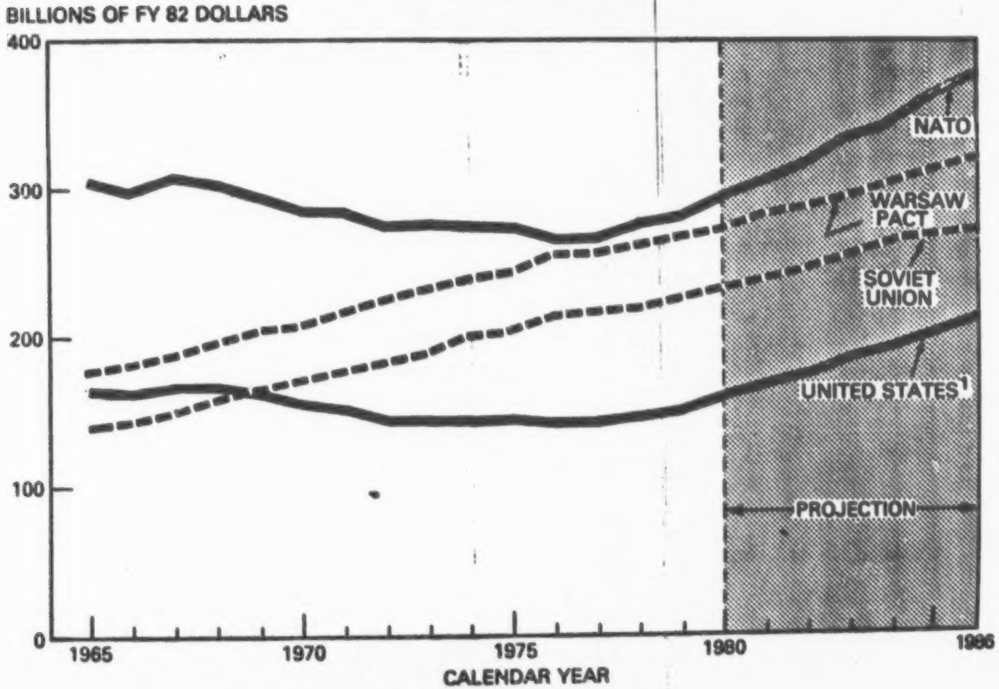
COMPARISON OF NATO AND WARSAW PACT TOTAL DEFENSE COSTS



[1] SOUTHEAST ASIA INCREMENT EXCLUDED (I.E., VIETNAM COSTS)

Source: Annual Report Fiscal Year 1982, Department of Defense, p. C-12.
Note: Such estimates are not constructed by the CIA.

leverage, political leverage, would be created on the part of the Soviet Union. It's not leverage that they could readily exploit, because if the Soviets were to likely shut off the supply of gas, that would have very bad effects on all economic transactions between the West and East. Also, they need to sell it as badly as West Europe needs to buy it.

So, it is not an easy thing for them to manipulate.

U.S. GRAIN SALES

Senator **Proxmire**. Isn't that also a compromise? You say—and the administration is attempting to discourage our European allies from entering into new natural gas agreements with the Russians. But we are selling the Russians more grain than ever.

From the standpoint of the Soviet economy, is there any difference between the two types of trade? How does Moscow interpret what has been described as an inconsistent attitude about East-West trade on our part?

Mr. **Rowen**. Energy, of course, is a purchase, by Western Europe, and the grain is a sale by Western countries. But there is a difference in the nature of the part of the transaction.

Senator **Proxmire**. But they get awfully dependent on that sale.

Mr. **Rowen**. Well, the argument on the energy is that if the gas were to be shut off, and it were to amount, say, to 30 percent of West Germany's gas, for example, and if this were to occur at the same time as a disruption of oil supply from the Middle East—and it is quite conceivable that it could occur at the same time—then the effect on the West European economies would be devastating.

And there is no question it would be devasting, if a combination of these events would occur. Economic output would rapidly plummet, unemployment would grow enormously. So there is a vulnerability, potential vulnerability, not just to gas alone, but gas plus other disruptions.

Senator **Proxmire**. How would that compare with the effect on the U.S. economy if the Soviet Union stopped buying grain from us?

Mr. **Rowen**. I have not done such an estimate. I don't know if anyone has done such an estimate. But by comparison, I have done some work, not at my present job, but a previous one, looking at the impacts on the Western European economies of various energy disruptions. And the magnitude of cuts can be very large, indeed—much, I would conjecture—much larger in terms of losses than any likely impacts from reduced sale of grain.

But that's just a pure guess on my part. I certainly haven't done the work.

The vulnerability of industrialized economies to energy interruptions, as we have seen in this country, after all, in 1973, and then again in 1979 and 1980, is really very high.

AFGHANISTAN

Senator **Proxmire**. To what extent has the Soviet invasion and presence in Afghanistan diverted resources such as rail transportation from the civilian sector? And are these diversions, in direct military cost, a significant burden on the economy?

Mr. **Diamond.** If Afghanistan had never come about, Senator, the Soviet transportation system would still be under considerable strain. As you know, it is highly dependent on rail as a means to move goods around the country. It's a very taut, high-density system. The logistics associated with the Afghan operation don't bulk that large, but when you have such a taut, highly strained railroad system in terms of ton-kilometers capacity, any additional load, even at the margin, any additional imposition on that system is obviously going to be quite disruptive. [Security deletion.]

INVESTMENT PRIORITIES

Senator **Proxmire.** To what extent is the economic slowdown a product of investment decisions made in the past decade or so, which emphasized defense production at the expense of the transportation, energy, chemical, agricultural, food-processing sectors? Is it "the" major principal reason for the decline, would you say?

Mr. **Diamond.** Today's basic priorities were established when Brezhnev and his colleagues assumed power in October 1964, and they set in train a basic set of decisions on what military capabilities they wanted—force composition and force strengths, effectiveness and overall level of stock of defense weapons. We have observed over the last 15 years, a near doubling of defense expenditures—a 90-percent to 100-percent increase in defense outlays—to meet these goals.

You have to ask yourself a hypothetical question to answer your question. For example, if they had held defense procurement constant at its 1970 level during the 1970's, and diverted the additional output of defense durables into output of producer durables for investment purposes, what would have been the impact on capital stock and GNP by 1980? We calculate that some 50 billion rubles of additional reproducible fixed assets could have been put in place by 1980, equivalent to less than 5 percent more capital stock. In other words, additional stock of plant and equipment that could be used in transportation, chemicals and other civil sectors of the economy. Under this set of conditions, Soviet GNP might have been some 1-2 percent larger in 1980.

CIVILIAN VERSUS MILITARY MACHINERY OUTPUT

Senator **Proxmire.** To what extent does defense spending explain the failure to increase the output of civilian machinery and the shortage of steel, cement and other basic materials?

Mr. **Diamond.** We have table 3 on that—on trends in civilian versus military procurements—military machinery.

[Table 3 follows:]

TABLE 3

GROWTH RATES OF SOVIET MACHINERY OUTPUT AND MILITARY HARDWARE PROCUREMENT

	1966-70	1971-75	1976-80	1981
Civilian Machinery	8.2	9.0	5.8	1.8
Military Machinery	3.6	4.5	3.4	5-7

Mr. **Diamond**. As you see here, in the last half of the 1960's, civilian machinery is growing at more than twice the rate of military machinery output. That same relationship held up in the first half of the 1970's—and indeed, up to 1978.

Senator **Proxmire**. Extremely volatile, the military component goes up between 1966–70, and 1971–75, and then down very sharply. And way up in the following period.

Mr. **Steiner**. Yes, that's driven mainly by major procurement cycles of strategic systems; major systems—submarines, ballistic missile systems for the submarines—and also underlying it is cycles in aircraft procurement.

Senator **Proxmire**. Can you make any kind of projection—what that is likely to be in the next 5 years or so?

Mr. **Steiner**. What is happening right now is, beginning in 1980 the Soviets came into a growth area of the cycle which will continue through 1983, and then they will taper off a bit.

We portray the growth in defense at 4 to 5 percent a year, but that is a long-term average. Within that, of course, there are cycles which are driven by the procurement programs.

Mr. **Diamond**. But the important point to make there, Senator, is that the Soviets have under construction an expansion program at their defense production facilities. They have that onstream right now. It is all in place.

Senator **Proxmire**. You argue that there is that tradeoff though, that as the civilian goes up, military goes down by and large, and vice versa? That wouldn't have happened in the 1971–75 period you referred to earlier, but it seems to be happening more in the others.

Mr. **Diamond**. In specific industries, yes. For example, at Nizhny Tagil, which is a big tank facility, the Soviets also produce some civilian transportation equipment, rail cars. The economy badly is in need of additional rail capacity, including rolling stock and diesel engines to move freight around the country. Here you have a huge plant at Nizhny Tagil that is producing tanks.

Now that is a direct tradeoff that was indicated in an earlier chart. So, when you ask a question about civilian versus military tradeoffs, yes, there is a direct correlation.

ARMS NEGOTIATIONS

Senator **Proxmire**. Let me ask a little more speculative question. I would think the Russians would be anxious to enter an arms reduction agreement, in view of their defense burden and prospects it will grow heavier.

They entered into a SALT II agreement, which the United States refuses to ratify.

What is their attitude about attempting a new agreement in the wake of SALT II? Can you give us any notion of how you judge that?

Mr. STEINER. I would say that while there would be the same incentives for them to enter into such agreement—primarily military—there may be a little bit more economic incentive at this point in time. But, given the nature of relationships right now, I don't believe they are very optimistic about a continuation——

Senator PROXMIRE. Are you saying they have an incentive but we do not? They are not optimistic because they feel we won't be interested.

Mr. STEINER. I'm saying they have an incentive, economic but primarily a military incentive. Their incentive toward SALT historically has been one of attempting to both restrain U.S. technological developments where they believe that we have a real lead—but also to some extent economic although not primarily. I believe that incentive remains. I am saying that I believe that their prognosis of the probability of a SALT accord in the near future is probably nowhere as high as it was 2 or 3 years ago, before SALT II ran into problems in the Senate.

Mr. ROWEN. Mr. Vice Chairman, let me just add a point. If you go back to the circumstances that surrounded SALT I and compare it with the situation today, it is really very different.

In the spirit preceding the 1972 SALT agreement, the United States had cut back its strategic forces very substantially during the course of 1960's, scaled back very greatly.

The Soviet Union had expanded its programs during the 1960's.

And of course as we know now with hindsight, it continued to do so contrary to the expectations of certainly some Americans involved in the process of negotiating that agreement.

The situation now is really quite different. The Soviet Union has already built itself up very substantially. The United States is now turning around and beginning a program much advertised, for increasing our own strategic forces. Whatever the incentives the Soviet Union had in early 1970's for SALT or that type of agreement, they would seem to be even higher today for the reasons I suggested.

Senator PROXMIRE. So our buildup is doing the job that some advocates of the buildup said it would do. In your judgment it is making them more willing to negotiate?

Mr. ROWEN. We don't know that yet. As Mr. Steiner said, there are several other factors——

Senator PROXMIRE. They may be pessimistic about it, but are we creating a situation where they recognize that we are not going to permit them to have an advantage no matter how much they put into it, we are going to match it?

Mr. ROWEN. That goes to the question which we are really not that expert—that is, what are the objectives of the administration in terms of our own defense policy. We really can't speak to that.

Senator **Proxmire**. I am making my own assumptions that that is what we will do. If we do that, what is your conclusion?

Mr. **Rowen**. I think just to address the Soviet side of this, if they are persuaded that we are embarked on a really very ambitious program to negate many of the gains that they have made in the last two decades—and those gains have been obviously very substantial—then with regard to incentives, the incentive is powerful for them to engage in really major arms control discussions aimed at reducing us, and hopefully giving away as little as they can for themselves.

On the economic side they also have a strong incentive to reduce their own allocation to the defense sector for reasons that we have discussed this morning.

So incentivewise, it has to be very powerful. But whether or not that will result in a negotiating position which will be one that couldn't possibly result in further agreement, it is very hard to say.

COSTS OF POLISH INVASION

Senator **Proxmire**. When they appeared before us, the Defense Intelligence Agency indicated the damage and production losses that could occur if the Soviets intervened militarily in Poland, and the costs that would be incurred partly explains the decision by Moscow so far not to intervene.

Will you comment on this view and give us your assessments of the chances of Soviet intervention in Poland?

Mr. **Rowen**. Let me be sure I understand the question.

Damage to production resources you say in Poland?

Senator **Proxmire**. That's right.

Mr. **Rowen**. That must be a factor.

Senator **Proxmire**. Damage to the Polish economy and so forth.

Mr. **Rowen**. The "and so forth" is important here. There is quite a lot of damage that might result.

Mr. **Diamond**. That is sort of an openended question. It depends somewhat upon the time of the year. For example, is it disruptive to agriculture operations which are now just coming to an end?

If the invasion had come in August, during the height of the grain harvest additional costs could be put in terms of how much more hard currency they would have to expend in the world's agricultural markets to sustain the Polish population. It may have been on the order of $7 or $8 billion if they destroyed enough crops as a result of hostilities—or, if the Poles had foregone harvesting their crops.

Now if they do it in November after the harvest of grain and other crops, that type of cost is avoided.

As far as damage to industrial plants, to the transportation system, to the infrastructure is concerned, it depends on how the Poles react.

I think we agree with DIA that in terms of direct costs to the Soviets to invade Poland with a minimum amount of resistance on the part of the Polish armed forces, it would be on the magnitude of about $10 billion. This estimate assumes no unusual damage to the Polish economy, including agriculture. In a size context this would be equivalent to about 8 percent of Soviet annual outlays on defense.

Senator **Proxmire**. Did they give primary weight to this consideration that the most likely time for this invasion would be winter, November–December?

Mr. **Diamond**. The "window of vulnerability" is before the snows reach any depth. Between mid-October and early December is probably logistically the most likely period.

Then again, of course, in the spring.

They would certainly like to avoid disruption to agricutural activity on either side of the border.

Senator **Proxmire**. Which they would do in the spring.

Mr. **Diamond**. But it would be less disruptive say, than in August or September when harvesting is underway on both sides of the border. [Security deletion.]

NUMBERS OF ENGINEERS AND SCIENTISTS

Senator **Proxmire**. It is sometimes argued that the Soviet Union produces many more engineers and scientists than we do. Their education at all high school levels is superior to ours with respect to scientific, mathematical training.

In the New York Times just in the last 2 days, there were articles that compared the years of physics, chemistry, and mathematics that our students typically have and that the Soviet students have. It was very appalling. It was pretty shocking that only 9 percent of our students, I think, take courses in physics. And those that do, have one or two years of it.

The Soviet Union mandates, requires 4 years and so on.

What are the facts as you see them here, and what implications does this have to our military strength in the future?

Mr. **Diamond**. The short answer to that is the market will dictate.

Senator **Proxmire**. The market seems to be ineffective here. You have people graduating with the B.S. degree, 4 years of college, getting top salaries, and a terrific incentive. A liberal arts B.A. can't begin to match it. The market offers $25,000 to begin with for kids just out of college. And yet we don't seem to able to supply enough engineers and scientists.

The market doesn't seem to be effective. This is not persuading people to concentrate in these areas.

Mr. **Rowen**. Mr. Vice Chairman, that's really, I think, an incorrect perception. There's a lag in the market, I think. The students don't have perfect foresight in electing the fields to go into. They do not see ahead all that well. But if one looks now at what happens at my university I have come from recently, Stanford University, the influx, the demand in engineering, has shot up pretty remarkably. This is true throughout the country in science to some extent, but especially in fields of technology.

I would predict in 5 to 8 years we are going to be talking about a glut of engineers.

I would add the point that we do know a good deal about the quality of the education recieved. My impression is that you have to be careful in the lables attached to various degree levels in the

Soviet Union, in that the level of training is not always as high as it appears from the labels.

Senator **Proxmire**. They might call an engineer or scientist, somebody we'd call a graduate of a vocational school.

Mr. **Diamond**. That's an important point as far as science education—there is no question that a much greater proportion of the relevant population have had higher mathematics, physics, and chemistry courses than in this country.

But Mr. Rowen makes a very apt point. It is true that they graduate annully three times as many engineers as we do. On the other hand they seem to have a great proclivity to misallocate engineers.

Soviet engineers are trained in narrow fields where courses have been preselected and relate to each speciality. Such narrowly specialized training acts as a weakness, however, making it harder for one system to adapt to technological change. Also many engineers and scientists are used in jobs which would not require engineering degrees in the United States, such as factory foremen or technicians in design bureaus. Soviet engineers do not have a market mechanism to provide the incentive for additional training. In fact an increasing number of engineers and technicians are taking jobs as blue collar workers in industry because of dissatisfaction with their positions and higher salaries as skilled workers.

Senator **Proxmire**. In past years, the CIA testimony included references to strikes, civil disturbances, and other signs of unrest—food shortages, and long queues? Has the number of such incidents increased or diminished?

Mr. **Diamond**. The number, as we measure, as we know about it, has not given us reason to believe the level of civil discontent, civil unrest has changed much in the 3 or 4 years.

The Soviet approach to handling the increasingly stringent situation as far as quality of food supply is concerned, is to set up a very elaborate rationing system, not only for the elites in the military, the technocracy and the party, but also in industrial plants. There is a very elaborate distribution system inside plants, and inside offices. So that what we see, what others see on the streets is basically for long queues, very long queues for the residual amount of certain foods, such as meat and dairy products. In other words, the food situation is worse at the retail level, for those people without some special access. Also, the food situation for them is worse now than it was in the mid-1970's, and earlier.

WORKER MORALE

Senator **Proxmire**. You mentioned declining worker morale. Is that a subjective judgment on your part? Or can you actually measure the morale of the Russian work force?

Mr. **Diamond**. That's based on numerous anecdotal materials, which suggest that morale is worse now than in the early 1970's.

Senator **Proxmire**. How does one really make that kind of a judgment, and make it in a way that you could rely on?

It seems to me that if I were asked how the morale in this country, of our work force, compares with the late 1960's, I just don't know.

I went to a University of Wisconsin meeting the other day with some very top people, and they say the morale of the kids is terrific now, so much better than it was in the sixties; vastly improved. They were very, very optimistic about it.

But it was a subjective judgment. I hope and pray they are right. They said the students' attitude is so much more constructive than it was. There is none of the lack of patriotism and so forth that was so unfortunate during the Vietnam period. In fact, it has gone the other way, in a very encouraging way.

But again, that was a subjective judgment. But I wonder if you can really rely on anecdotal evidence.

Mr. Diamond. [Security deletion.] For one thing, Western scholars who have visited the Soviet Union have put pen to paper in the last 20 years, saying "I was in the Soviet Union in the early 1960's, late 1960's, early 1970's, late 1970's, have had perhaps 10 years' experience over the last 20 years, and here is my perception, given the contacts I have with the Soviet system and my Soviet contacts. Here is my personal view of how things have changed." They are describing some of the manifestations of what Professor Bialer of Columbia University calls the politics of stringency. We have been persuaded by this and other evidence [security deletion] that indeed there has been a meaningful change in attitudes, especially of the younger population.

Senator Proxmire. Let me ask you this: Do you have more confidence in the estimates of morale in the Soviet Union than you have on the estimates of morale in this country?

Mr. Diamond. Naturally no.

Senator Proxmire. How much confidence do you have when people say morale is better in this country than it was 10 years ago? Do you buy that or not?

Mr. Diamond. I buy that. I buy that, because I go into classrooms, and I talk to professors at a wide range of universities and privately——

Senator Proxmire. I am not talking about the students. I am talking about the whole economy, the economy as a whole.

Mr. Diamond. I have to depend on what I read in the popular press.

Mr. Jackson. Can I add something to this? [Security deletion.] Twenty years ago, Khrushchev launched the 20-year program that by 1980 the standard of living in the Soviet Union would be brought up to that in the United States. And I think through the 1960's, people felt that there was a fighting chance to get there. Maybe it was an ambitious goal, but things were improving.

The constant theme I hear now is a shift towards much less optimism somewhere in the 1970's.

Senator Proxmire. See, in this country, it's so hard—I think if you talk to business people, morale is a lot better. There's no question about it. Most of them are sold on the Reagan program. They think we are really moving in the right direction, and they are enthusiastic. Some of them are euphoric—a much different situation than we had a few years ago.

You talk to a lot of working people, and others, it's not the same picture. It's different. It depends on what their experience is, particularly the fact that unemployment has increased, for instance.

Talk to people in the homebuilding industry, particularly the workers, construction workers, where unemployment is 16 percent now. They have either lost their job, know somebody that has, or are afraid they will lose their job. Morale is terrible.

So I think in this country, it's varied, and I would think it's hard to generalize on a country as diverse and massive as the Soviet Union.

INVESTMENT AND PRODUCTIVITY

Let me ask you this: There is great controversy over the causes of the productivity slump in this country—and we have had a productivity slump. If there is any consensus—it is that an increase in investment and an improved capital-labor ratio would improve productivity.

But in the Soviet Union, there has been a tremendous emphasis on investment. They can do it because they have a totalitarian state. They have depressed consumption, and yet productivity growth is declining. How confident are you about the nature of the Soviet productivity problem?

Mr. **Diamond**. There are two facets to that. We are reasonably confident that we are measuring it properly. We are less confident on what the basic causes are. Capital stock, the stock of plant and equipment, has risen even though investment growth has been slowing. The Soviet stock of plant equipment has been rising at a very rapid rate, between 5 and 7 percent annually over the last 20 years. And in the face of that, we see not only declining growth in total productivity, but growth in labor productivity has fallen from a 4½ percent average annual increase in the first half of the 1970's down to 1½ percent, and maybe even lower, this year.

Senator **Proxmire**. Does that coincide with their figures, too? The Soviet Union's figures confirm that? Do they claim something else?

Mr. **Diamond**. They claim a higher growth in labor productivity but the configuration of trends are the same.

Senator **Proxmire**. They admit their productivity growth is slowing down?

Mr. **Diamond**. Yes.

They have the same configuration of trends in the official statistics.

Senator **Proxmire**. Somehow, it's not working. And that is a fascinating fact, that you have an increase in investment in plant and equipment, as you say, and a decline in productivity growth, by their own statistics. It is not a matter of our estimates; it is a matter of their own figures showing that they have a decline.

Mr. **Diamond**. That's right.

Senator **Proxmire**. Maybe this means the notion that investment is the key is not as clear as we thought it was.

Maybe you need somthing else, as far as the management and work ethic and morale, and so forth.

Mr. **Diamond**. Well, some observers of the Soviet scene argue that his declining growth in productivity is a key indicator of the deep-seated cynicism on the part of a society, as Dave Jackson indicated, that no longer believes the good life is coming, as Khrushchev promised them in the 1960's.

We believe there is a feeling, widespread in Soviet society, covering all social groups, that lack of progress in the standard of living in real terms has affected them. This is a broad phenomenon. They feel the standard of living is leveling off, and their chances of having, for example, car ownership or an individual apartment with relevant accoutrements, is nil, as opposed to 15 or 20 years ago, when their expectations were very high that they and their children would have, by this time or in the 1980's, much more than in the 1960's or 1970's.

EFFECTS OF DEFENSE SPENDING ON GNP

Senator PROXMIRE. One hard, clear fact which you seem to have confirmed earlier was that the diversion of resources to the defense sector, and the emphasis on the military production has had an overall depressing effect on Soviet GNP.

Mr. DIAMOND. Somewhat depressing effect but probably less than popularly perceived.

Senator PROXMIRE. Very good.

I just have one other question for the record. Will you supply for the record, Mr. Rowen, annual real defense spending rate increases or decreases since 1955, and explain how you adjust the figures for inflation?

Mr. ROWEN. Yes, we can.

[The following information was subsequently supplied for the record:]

SOVIET DEFENSE EXPENDITURES

In the USSR, information on defense spending is a closely guarded state secret. Only one statistic—a single-line entry for defense in the published state budget—is reported each year. This figure is uninformative because its scope is not defined and its size appears to be manipulated to suit Soviet political purposes. (Changes in the announced defense figure do not reflect the changes we have observed in the level of military activities.)

To provide information which the official defense entry does not, CIA periodically estimates the cost of Soviet defense activities. Our estimates begin with a detailed identification and listing of the activities and physical components which make up the Soviet defense program for a given year. By a variety of methods that data base is converted into a value estimate in 1970 rubles at factor cost.

The expenditure estimates in the accompanying graph and table were derived using this direct-costing or building-block approach. They are based on a broad definition of Soviet defense expenditures which includes activities that the Soviets may define as defense related but which are not included with the US definition of defense. These include expenditures for internal security forces, construction and railroad troops, and the type of space programs that are carried out by the military in the USSR but by NASA in the United States. Overall, we believe the quality of our estimates is significantly higher from the late 1950's on than for the early and mid-1950s. We have less confidence in the description we have of Soviet military activities during the earlier 1950s and in the constant 1970 ruble values we apply to them than we have in the physical data and ruble values for later years.

The figures in table 4 and chart 7 represent the upper and lower bounds of a 90-percent confidence interval around our estimate of Soviet defense expenditures from 1951 through 1980. The interval was derived by quantifying and combining subjective estimates of confidence in the estimates of the elements of the major components—RDT&E, procurement, construction of military facilities, personnel, and O&M—that make up the total. The size of the interval changes over time as the weight of the component estimates and our confidence in them varies. For example, the interval is wide through most of the 1950s because our confidence in nearly all of the component estimates is lower for that period than for subsequent years. The narrower interval in the 1960s and early 1970's reflect our greater confidence in the estimates for those years. The interval widens again in the 1970s as the estimate of spending for military RDT&E, in which we place relatively low confidence, increases as a share of the total, and the estimate of military personnel costs, to which we attach high confidence, decreases as a share.

Table 4 and chart 7, referred to above, follow:

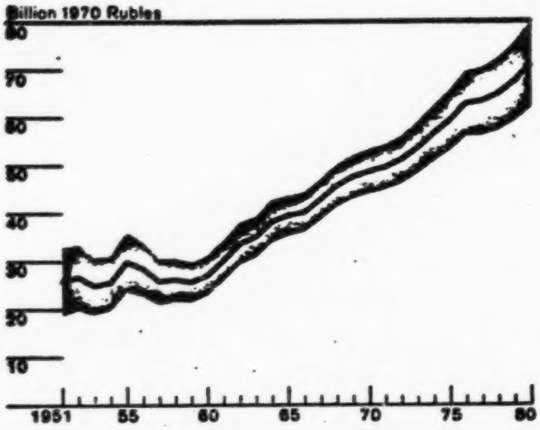
Table 4

ESTIMATED SOVIET DEFENSE EXPENDITURES, 1951-80
(Billion 1970 Rubles)

Year	Upper	Lower
1951	33	19
1952	33	20
1953	30	19
1954	31	20
1955	36	24
1956	34	23
1957	30	21
1958	30	22
1959	29	22
1960	31	23
1961	34	26
1962	38	29
1963	39	31
1964	42	34
1965	43	35
1966	44	36
1967	47	39
1968	50	42
1969	52	43
1970	53	44
1971	54	45
1972	56	46
1973	58	48
1974	62	51
1975	65	53
1976	69	56
1977	70	56
1978	72	57
1979	75	59
1980	79	62

CHART 7

Estimated Soviet Defense Expenditures, 1951-80



Senator PROXMIRE. Thank you, gentlemen, we very much appreciate your testimony. I think it has been most enlightening. And we are looking forward to releasing it as soon as possible, because I know other members who couldn't be here today, and in the Congress generally, and in the public, will be enlightened by your fine testimony.

Thank you very much.

Mr. ROWEN. Thank you, Senator.

Senator PROXMIRE. The subcommittee is adjourned.

[Whereupon, at 11:35 a.m., the subcommittee adjourned, subject to the call of the Chair.]

[The following information was subsequently supplied for the record by Mr. Rowen:]

ASSESSMENT OF THE STATE OF THE SOVIET ECONOMY DURING 1981 AND THE FIRST QUARTER OF 1982

Following three consecutive years of GNP growth at less than 2 percent, the Soviet economy got off to an even worse start in 1982. Soviet industry grew less during the first quarter--0.6 percent above that achieved during the first quarter of the previous year--than any comparable time since World War II. In four of the ten major industrial categories, including ferrous and nonferrous metals, construction materials, and soft goods, production ranged from 0.5 to 5 percentage points below levels of 1981. Oil and coal output were virtually unchanged from last year. Perhaps more ominous to the leadership, however, is that labor productivity--being counted on by the leadership to provide most of the growth in output--did not increase at all.

The increasingly taut state of the economy is responsible for much of this year's slump. Breakdowns in production and distribution in one sector reverberate throughout the entire system, idling capacity and disrupting production schedules. With some improvement likely by the end of this year, industrial production likely will grow some 1 to 1.5 percent for the year as a whole. Still, this would be a record postwar low. Another poor showing this year, coming on the heels of three successive years of record low growth rates, would knock the Eleventh Five-Year Plan (1981-85) into a cocked hat and dash Moscow's hopes of rejuvenating industrial productivity in the short-to-medium term.

1981 Results

The Economy. GNP grew at an estimated 1.8 percent in 1981, with all sectors performing in disappointing fashion. Farm output barely surpassed the depressed level of 1980, falling some 10 percent below the peak level achieved in 1978. The most striking negative development, however, was the decline in the growth of industrial production from 2.9 percent in 1980 to 2 percent in 1981.

Industry. The lackluster performance of Soviet industry, particularly the coal, steel, and machinery sectors, is a particularly bad omen for the Soviet economy (see table). Falling coal production, for example, is undercutting Soviet plans to increase the use of coal in the generation of electricity and is a major constraint limiting the production of steel. The slow growth of construction materials, stagnant output of ferrous metals, and the lagging performance of civilian machinebuilding imply that even the historically low rate of investment growth planned for 1981-85 (1.6 percent per year) may be unattainable.

The low growth of civilian machinery output must be particularly alarming to Soviet officials. New, more technologically advanced products are badly needed to renovate and modernize the aging capital stock in the USSR, to stimulate energy development and conservation, and to substitute for increasingly scarce labor resources.

SSR: Growth of Gross National Product,[1] by Sector of Origin

annual percent change

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
NP	7.7	3.9	1.9	7.3	3.9	1.7	4.8	3.2	3.4	0.8	1.2	1.8
Agriculture[2]	12.4	-0.4	-5.6	14.7	-0.3	-8.7	8.1	4.6	3.2	-5.9	-5.1	0.1
Industry	7.0	6.1	5.0	5.8	6.5	6.2	3.9	4.0	3.5	3.0	2.9	2.0
Construction	7.7	6.7	5.2	5.9	5.3	4.9	3.4	2.4	3.0	0.8	2.5	1.9
Transportation	6.6	6.7	5.5	7.2	7.0	6.1	4.4	2.2	4.6	2.4	3.8	3.8
Communications	7.5	7.3	7.4	7.2	7.2	7.2	6.4	5.6	5.5	5.6	5.7	4.9
Trade	7.0	4.8	3.3	5.3	5.0	4.5	3.6	3.6	3.4	2.4	2.4	3.0
Services	3.8	3.7	3.5	3.3	3.3	3.1	2.5	2.5	3.1	3.0	3.0	2.6
Other	2.7	2.8	2.0	1.9	1.6	1.2	1.7	0.6	0.9	0.8	0.7	0.9

Because of the well-known difficulties in using Soviet established prices to measure eal economic growth, the growth rates in this table are based on GNP at factor cost in 970 prices. In calculating GNP at factor cost, 1970 weights have been revised from an stablished price basis to a factor cost basis by subtracting turnover taxes and profits nd adding implicit amortization and capital charges and subsidies. These revised weights re then moved over time by indexes in constant prices.

Excluding intra-agricultural use of farm products; no adjustment is made for purchases y agriculture from other sectors.

USSR: Index of Gross National Product Growth,[1] by Sector of Origin

1970=100

	1965	1966	1967	1968	1969	1970	1971	1972
GNP	77.4	81.4	85.1	90.3	92.8	100.0	103.9	105.9
Agriculture	82.8	86.6	86.6	91.7	88.9	100.0	99.6	94.0
Industry	73.8	77.9	83.3	88.7	93.5	100.0	106.1	111.4
Construction	75.3	78.8	84.8	89.3	92.8	100.0	106.7	112.2
Transportation	72.2	76.8	83.6	89.3	93.8	100.0	105.7	112.6
Communications	65.4	72.3	79.8	85.5	93.0	100.0	107.3	115.2
Trade	71.3	76.9	82.6	88.7	93.5	100.0	104.8	108.3
Services	81.3	85.0	88.6	92.7	96.3	100.0	103.7	107.4
Other	83.8	85.7	89.0	93.5	97.3	100.0	102.8	104.8

	1973	1974	1975	1976	1977	1978	1979	1980	1981
GNP	113.6	118.0	120.0	125.7	129.7	134.1	135.2	136.8	139.3
Agriculture	107.8	107.5	98.2	106.1	111.0	114.6	107.8	102.4	102.5
Industry	117.9	125.5	133.2	138.4	143.9	148.9	153.4	157.8	160.5
Construction	118.8	125.0	131.2	135.6	138.9	143.0	144.1	147.7	150.5
Transportation	120.7	129.2	137.0	143.0	146.2	152.9	156.6	162.5	168.7
Communications	123.5	132.4	142.0	151.1	159.6	168.3	177.6	187.9	197.2
Trade	114.0	119.7	125.1	129.6	134.2	138.7	142.0	145.3	149.7
Services	111.0	114.7	118.2	121.2	124.2	127.9	131.8	135.7	139.2
Other	106.8	108.5	109.8	111.7	112.3	113.3	114.2	115.0	116.0

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[1] Calculated at factor cost.

USSR: Industrial Production*

(percent average annual rate of growth)

	1971-75	1976-80	1980	1981
Total industrial production	5.9	3.4	2.9	2.0
Industrial materials	5.4	2.6	2.5	1.6
Electric Power	7.0	4.5	4.5	2.3
Fuels	5.0	3.3	2.3	0.9
Nonferrous metals	5.9	2.6	0.8	0.3
Ferrous metals	4.0	1.1	-0.3	0.2
Wood, pulp and paper	2.6	-0.1	2.8	2.2
Construction materials	5.4	1.8	1.0	1.2
Chemicals	8.6	3.8	5.2	3.5
Total machinery	7.9	5.4	4.4	2.6
Consumer nondurables	3.4	1.6	0.1	2.1
Light industry	2.7	2.6	2.0	2.5
Processed food	3.9	0.7	-1.4	1.7

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*Based on CIA estimates rather than Soviet official series. The latter are believed to contain an upward bias in rates of growth because of double-counting and disguised inflation. Branch indexes are formed by combining a sample of products in which intrabranch purchases are excluded. Indexes for industrial materials, consumer nondurables, and total industrial production are formed by combining the component branch indexes using 1970 value-added weights. For a discussion of these issues see Central Intelligence Agency, "Comparing Planned and Actual Growth of Industrial Output in Centrally Planned Economics," A Research Paper, ER 80-10461, August 1980.

Energy. The growth in major fuels (oil, natural gas, and coal) production slowed to about 1 percent in 1981. Oil production increased 1 percent with an even smaller increment to output targeted for 1982. Even though drilling activity increased by a record amount, delays in bringing crucial gas-lift oil recovery projects on stream and the lagging development of rail networks, all-weather roads, and electric power facilities have constrained production activity.

Coal is probably the USSR's most pressing energy problem, however. Last year output of raw coal fell for the third year in a row--to 704 million tons, some 12 million tons less than the previous year and 34 million tons short of plan. Three major factors continue to hamper coal production: (1) deteriorating conditions--notably increasing depths and narrowing seam thickness at the larger, established mines; (2) insufficient investment has resulted in delays in bringing new capacity, particularly open-pit mines, on stream in time to offset output declines at older basins; and (3) increasing labor intensity of operations coupled with difficulty attracting new laborers into the dangerous, unattractive mining profession.

In contrast to oil and coal, Soviet natural gas production increased almost 7 percent, with practically the entire increase coming from West Siberian fields. The USSR possesses a huge natural gas reserve base--almost 40 percent of total world proved reserves.

Agriculture. Serious harvest shortfalls were widespread last year. Grain production may have been as much as 80 million tons below the plan target of 1981. The sugar beet crop dropped almost 25 percent to the lowest level since 1963, and potato production was up only slightly from last year's severely depressed level. A near record cotton harvest was the single exception to an otherwise dismal agricultural year.

In the livestock sector, overall herd numbers increased slightly after stagnating in 1980 as increases in cattle and sheep offset a small decline in hog inventories. Figures on private herds, however, were not published in the annual plan fulfillment report. We suspect that private livestock holdings may have fallen for the fourth consecutive year. Despite the regime's promise of increased support for private agriculture, feed supplies have become increasingly tight, and private farmers may be slaughtering their holdings or selling them to socialized farms. To compensate for the shortfalls in domestic production, large quantities of agricultural commodities again had to be imported in 1981.

Capital Formation. The increase in additions to new plant and equipment slumped to 2 percent last year reflecting both the low rates of growth of new fixed investment during the previous two years and the continuing inability of Soviet planners to significantly reduce the level of unfinished construction.* Even though the level of unfinished construction fell in 1980, the reduction was small--slightly over a billion rubles. This can be compared with a value of unfinished construction of over 105 billion rubles in the economy as a whole, equivalent to approximately 80 percent of the total volume of new fixed investment that year.*

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* Unfinished construction refers to construction and installation work underway but not finished to the point of permitting use of these assets. Included is equipment in the process of being installed or actually in place in uncompleted structures.

Consumer Welfare. Soviet living standards as measured by per capita consumption increased approximately 1.5 percent last year, about the same as in the previous year but less than the annual gains attained during the 1970s. Food supplies in state retail outlets continued to dwindle as increasing amounts were diverted to factories for distribution. The leadership clearly regards the food shortages as serious. At the November plenum, Brezhnev cited it as the most critical economic and political issue of the 11th Five-Year Plan. Meanwhile, the authorities invoked a system of purchase norms last summer in some areas--a type of informal rationing whereby purchases of both quality foods, and bread and other cereal products are strictly limited.

To compensate for the shortfalls in domestic food production, large quantities of agricultural commodities again had to be imported in 1981. Hard currency imports--largely grain, other feedstuffs, meat, sugar, and vegetable oil--reached $11 billion, up sharply from $8.8 billion the previous year. Agricultural imports accounted for two-fifths of Moscow's total hard currency merchandise imports in 1981, compared with one-third in 1980. Food supplies are being kept at tolerable levels by these large food imports. Per capita meat availability, for instance, increased fractionally due to record meat imports in 1981--980,000 tons--and a slight increase in domestic production, but still remained at about the 1975 level.

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* This comparison can only be considered approximate since uncompleted construction is given in current prices and new fixed investment data are published in 1973 prices.

Leadership Response

Moscow still has not formulated a policy to deal with the economic slowdown. Nor have any new or viable solutions for revitalizing effectiveness in planning and management been put forth. The essence of the Kremlin's program has been to stress the need for more innovation and technological change in industry; material savings and the conservation of fuel and other natural resources are also being emphasized. These programs are a replay of measures tried in the past with little success. The obstacles to innovation and technological change that have plagued the Soviets in the past--a cumbersome organizational structure, inflexible prices, and a perverse incentive system--remain unaltered.

It is also difficult to be sanguine about Soviet plans for material and energy savings. The conservation targets set forth in the 11th FYP guidelines and the strict standards for resource use by enterprises and ministries established in a major party-government decree last July are more an expression of what would have to happen to achieve balance in key areas than a reasoned estimate of what is possible.

Overall, there still are no indications that Moscow is any more willing now than in the past to make basic structural changes to the existing economic mechanism. Recent attempts at reform have been implemented sluggishly and with little enthusiasm. The comprehensive decree of July 1979, for instance, rather than resulting in significant reform, has spawned more centralized, rigid, and detailed planning than before. Also the high level interdepartmental council established last year to evaluate economic reform measures adopted in Eastern Europe still has not come forth with any new proposals for the Soviet economy that deviate from established practices.

USSR: Growth of Gross National Product at Factor Cost,[1] by End Use

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Consumption	4.6	3.6	2.4	4.1	3.7	3.9	2.3	2.9	2.9	2.9	2.3	2.4
Investment[2]	12.7	4.8	4.2	9.2	6.6	2.2	8.0	5.1	3.7	1.6	2.7	3.4
New fixed[3]	14.3	3.5	3.1	8.2	6.2	3.2	7.6	4.4	3.1	1.2	2.3	3.0
Defense, administration, R&D, inventory change net exports, and outlays n.e.c.	10.0	3.2	-3.3	14.2	-0.1	-6.3	7.1	0.4	4.6	-7.7	-6.2	-4.1
Gross national product	7.7	3.9	1.9	7.3	3.9	1.7	4.8	3.2	3.4	0.8	1.2	1.8

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[1] Because of the well-known difficulties in using Soviet established prices to measure real economic growth, the growth rates in this table are based on GNP at factor cost in 1970 prices. In calculating GNP at factor cost, 1970 weights have been revised from an established price basis to a factor cost basis by subtracting turnover taxes and profits and adding implicit amortization and capital charges and subsidies. These revised weights are then moved over time by indexes in constant prices.

[2] Includes machinery and equipment, construction and other capital outlays, net additions to livestock, and capital repair.

[3] Total investment less capital repair.

USSR: Share of Gross National Product at Factor Cost, by End Use

	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Consumption	54.0	54.2	54.1	54.3	52.7	52.6	53.8	52.5	52.4	52.1	53.2	53.8	54.1
Investment	27.3	28.2	28.5	29.1	29.7	30.4	30.6	31.5	32.1	32.2	32.4	32.9	33.4
New fixed	22.1	23.4	23.3	23.6	23.8	24.3	24.6	25.3	25.6	25.5	25.6	25.9	26.2
Defense, administration, R&D, inventory change, net exports, and outlays n.e.c.	18.7	17.6	17.4	16.5	17.6	16.9	15.6	15.9	15.5	15.7	14.4	13.3	12.5
Gross National Product	100	100	100	100	100	100	100	100	100	100	100	100	100